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Welded Steel for Motor Frames

History of the Application to Induction Motors—Findings in Costs of Material, Labor, Inventory, Tool Room Expense and Overhead

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EVERY manufacturer (including those of electric motors) has one object in view: to build a good product which can be sold for enough more than it costs to make the business profitable. Simplified practice is good, but the simplicity of the present day motor is extreme, as illustrated in the accompanying views. Principles of design are common property. All the manufacturer, any manufacturer, has to do is to make these parts better and at less cost than his competitors.

Use of welded steel construction in place of castings was considered by the Lincoln Electric Co. in 1921, because the practice promised to reduce manufacturing costs. Every other manufacturer used castings; we also used them. The finest way in the world not to beat your competitor's cost is to follow his method of manufacture. Trying to beat a foundry's cost with another foundry is poor business. Back in 1912 we had replaced a cast iron starter case with one made of welded steel, saving a good percentage, and since in 1921 there was plenty of encouragement for cost reduction programs, we started into welded steel construction at that time.

The frame offered the best possibility of saving, because the frame is the heaviest casting used on an induction motor. No one had ever built a motor frame by welding together pieces of hot rolled steel into the equivalent of a casting, and few believed that it could be done economically.

Main Frame Bent on Home Made Roll

The idea of rolling structural angles, welding the ends together, and then joining two rings by cross members appeared to be the logical solution. The foot, or base, was a simple matter of plate construction.

The first rings were made in an outside anglesmith shop, and the first welded steel frame cost more than a

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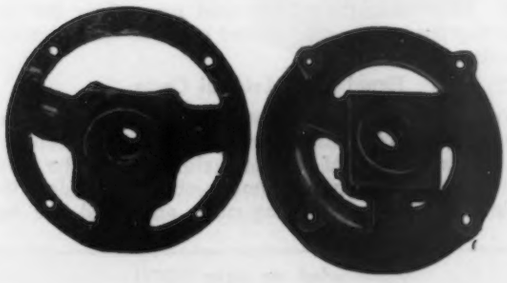
Welded Steel Motor Frame and, at Right, a Cast Iron Motor Frame



Above Views Show Evolution of Base Rails. Rough casting at left cost $5.21; welded substitute at right $3.04

At Left—End Bracket of Cast Iron, Being of Somewhat Complicated Shape, Costs Only 66 Per Cent of Welded Part

cast frame, which was not so good. Then the problem became one of cutting the corners on manufacturing methods to get the most out of the new method of construction. The steel shapes certainly cost less than the cast iron. Two cents per pound for steel angle iron against 6c. per pound for a rough casting looked good, particularly in view of the fact that in steel only one-half the weight would be required. The superior physical properties and lower cost gave steel a six to one advantage to start with. If we could avoid spending all the material-saving on fabricating labor, the problem was solved.

Rolling the rings in the anglesmith shop was the most expensive operation. We went after that item first. A worm and gear mechanism from an old elevator hoist was rigged up to roll the rings hot, and a heating furnace installed. A hole was punched in one leg of the angle iron near the end and a pin provided on the roll so that the angle was held against one roll during the operation. The second roll was held against the angle by a lever mechanism. Rolling a 3 x 4-in. angle on the outside by ordinary methods had cost us $18. The same job on the above described machinery was done at a cost of $4.47, including labor, material and overhead.

This saving brought us to a point where welded frames were possible. The next move was to eliminate intermediate steps on some of the other operations and speed the whole job up. Buying material from the steel warehouse cut to size cost 3c. per pound; we changed and bought steel from the mill at 2c. per pound delivered in Cleveland and made dies to cut it on one of our power presses. This brought the material cost, cut to size and ready to assemble by welding, down from $18.21 to $13.67 on what we call a "type IL" frame. The labor cost of assembly and welding started off at $4.15. By increasing the welding heat and speed, this figure was brought down to $2.80.

Since cost reduction is necessarily a continuous process, there is given herewith a tabulated history of the cost reductions made on several sizes of frames. The present cost of these frames represents an evolution of manufacturing methods made in an effort to find the best and least expensive way of doing the job. We have long since given up the idea that there is any permanently best way of doing any job. The most that can be said of any manufacturing method is that it represents the best we know of at the present time, and we are reasonably certain that some of them will be obsolete before long.

It should also be emphasized that these welded frames have inaugurated definite improvements in the electrical assembly and operating characteristics of the motors. This matter was described at length in THE IRON AGE, July 9, 1925.

The next castings to be studied were the base rails. We never did like the cast iron ones for the reason that they were frequently broken in handling, shipping and installation. The matter of appearance came up into the discussion, but no one seemed to have any definite standards on how base rails ought to look. We gained courage from the acceptance of the welded steel motor frames by the trade, so aesthetic considerations were subordinated and the base rails were redesigned as shown, reducing the cost in the "500 series" from $5.21 to $3.04 each.

We heard no complaint from the trade on the angle steel rails.

History of Cost Reduction on Motor Frames

Frame	Jan., 1924, Cast Iron	Jan., 1925 (Rings Rolled Outside Plant)	Jan., 1926	Jan., 1927	
IL	$37.35	$57.38	$23.86	M	$8.68
				L	4.57
				O	7.54
					$20.79
IM	41.34	58.35	25.45	M	$9.01
				L	4.58
				O	7.56
					$21.15
IP	46.00	62.60	29.81	M	$9.28
				L	4.68
				O	7.72
					$21.68
IQ	48.76	65.84	31.01	M	$9.61
				L	4.89
				O	8.07
					$22.57
IR	51.16	67.19	32.35	M	$9.92
				L	5.08
				O	8.38
					$23.38

M—Material.
L—Labor.
O—Overhead.

Complex End Brackets Still Cast

Motor end brackets proved a far more difficult matter, due to the complicated shape of the part. The welded steel equivalent of the cast iron end bracket required a relatively high labor cost to get the desired shape, due to the cutting and forming operations involved. One of the illustrations shows one design of sleeve-bearing end bracket made in welded steel, which analysis showed to cost $1.63 each. The casting it was designed to replace cost only $1.08. It is obvious that welded steel construction had no justification in this instance and the design was rejected. On the other hand, the ball bearing end brackets of somewhat larger size have been changed over to welded steel because they may be made a few cents cheaper. New designs are in process of being worked out for the sleeve-type end brackets, which promise to overcome the high cost of the original.

One of the replacement jobs which yielded a very great saving was that of substituting welded steel bases for cast iron bases used on motor-generator sets. Analysis of the existing designs led to the discovery that most bases seem to be designed so that the biggest man with the biggest wrench cannot distort the base when it is mounted on its foundation. In the steel design, the nuts on the foundation bolts were made to bear on the outstanding leg of a steel angle in such a manner as to permit distortion of the flange without warping the base. This made it possible to reduce the designed stiffness of the base and save a great deal of material.

Costs Cannot Be Known Until Sales Are Made

Any attempt to generalize on the relative costs of castings and welded steel construction must necessarily be restricted to the three main elements of cost in manufacturing: Material, labor and overhead. These elements, of course, do not tell the whole story—for instance, all three items might be reduced, but a product turned out which few people would want to buy. Anyone who claimed that he had made a real cost reduction under such conditions would be considered slightly insane. Any practice which results in restriction of sales nearly always increases costs, and conversely any change in manufacturing method which results in increased sales, decreases costs more rapidly than is indicated by a mere statement of the material, labor and overhead saved.

Following this line of argument, we hold that a cost reduction is never actually proved until its effect on sales is shown. The most striking example of the fundamental nature of this principle is the Ford Model T car. To effect cost reductions practically no changes were made. Material, labor and overhead reductions were made steadily year after year. But finally not enough people wanted to buy the automobile. The net result, therefore, during the first months of 1927 was that so few cars were sold that cost increased up to the point that production had to be discontinued.

Reverting to our own problem, this discussion of costs will be confined to material, labor and overhead costs. Since sales have increased more than 100 per cent after the adoption of welded steel, no sales damage has occurred.

Equal Raw Material Costs

No matter where the casting is made, the cost of the necessary steel is the same as the cost of foundry pig to make a piece of the same rigidity. In the plant which buys its castings from a jobbing foundry, the problem is to buy, cut, assemble, and weld the hot

(*Concluded on page* 1567)

Milling Machine of New Design

Hydraulic Table Drive Provides Flexibility of Feed Control—Bed and Other Units Designed for Heavy Duty

ONE tendency attracting attention at the exposition held by the National Machine Tool Builders' Association at Cleveland, Sept. 19-23, was the wider utilization of hydraulic feeds. New applications of this method of feed included its use in automatic milling machines known as the "Giant Hydromatics," shown for the first time by the Cincinnati Milling Machine Co., Cincinnati. The arrangement of the hydraulic table-reciprocating mechanism, as well as other features of these machines, is outlined in the following paragraphs from data recently made available by the Cincinnati company.

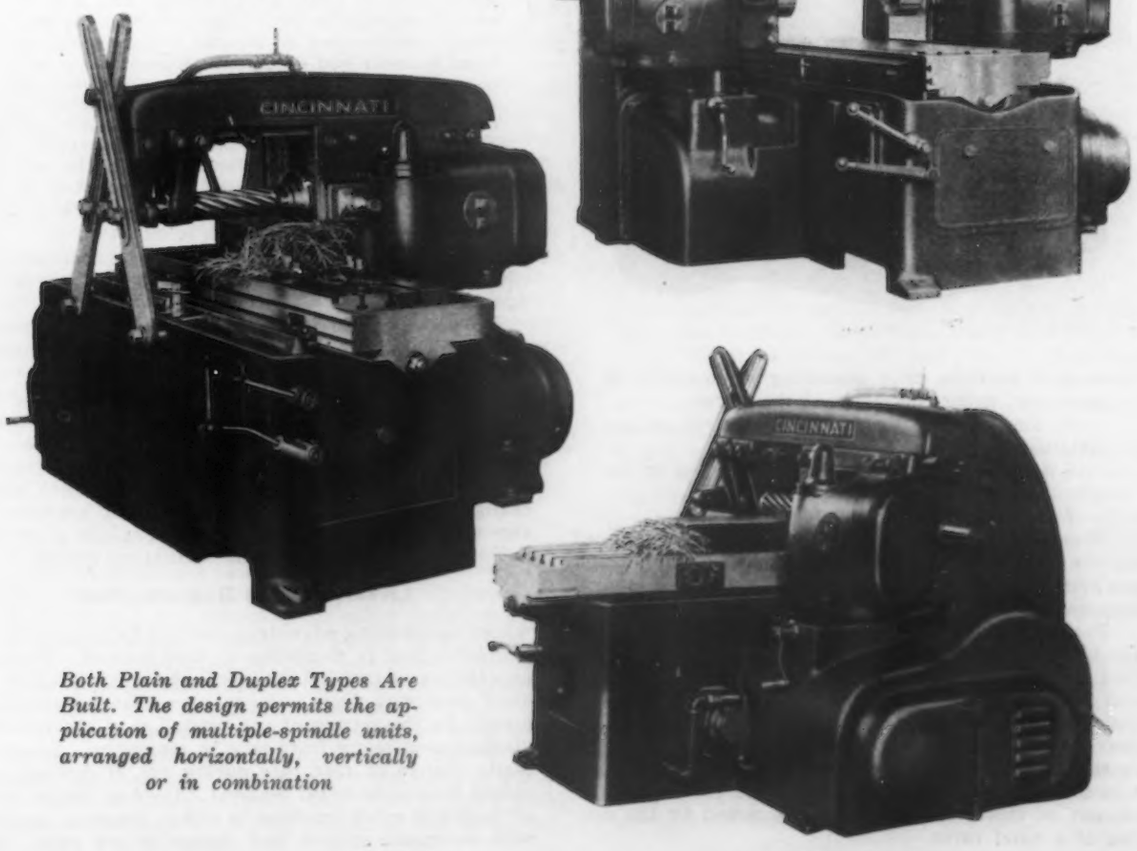
The machines are built in plain and duplex types and in a number of sizes ranging in table travel from 36 to 72 in. and in table widths from 16 to 24 in. In weight the machines range from 9500 to 18,000 lb.

It is stated that in designing the machine the general structure of a planer, generally regarded as the heaviest type of machine tool, was followed, particularly the long bed for supporting the table and the rugged housings for supporting the cutting tool. The design adopted is flexible in that it not only allows wide bed machines, but also permits the application of multiple-spindle units arranged horizontally, vertically and a combination of both.

The housings, which carry the spindle-driving unit are of box section and heavily ribbed. The lower compartment contains, on one side, the motor, and on the other side the preliminary driving units such as multiple-disk friction clutch and spindle reverse mechanism. The upper part carries the spindle carrier. The latter is a self-contained unit in which the entire gear transmission, including the spindle speed change gears, are mounted. This unit also carries the large quill which provides for the lateral adjustment of the cutter. The quill is of high carbon steel, heat-treated, and adjustment is made through a self-locking worm and rack construction. It is rigidly clamped in the spindle carrier around its full diameter by one bolt.

The table is mounted directly on the bed, which is of new design. Disposal of the chips produced and also of the large amount of cutter coolant is through the large chamber underneath the table. The portion bed which carries the table is of tubular cross section and is made integral with the side walls by cross bridges of oval section. These bridges are spaced to permit free passage of the longest chips falling from the table into the bed, and a large door at the front end of the machine allows for quick removal of the chips. Coolant is returned to its reservoir through a large strainer inside of the bed. Simple splash guards may be attached to the bed to confine the coolant inside of the table area. The rear end of the bed carries in a separate chamber the self-contained "hydromatic" feed unit with its pump, valves and oil reservoir. The table bearings on the bed are the full width of the table and are

In Addition to Hydraulic Feed, Features Include a New Design of Bed and Facilities for Chip Accumulation and Disposal. One-position operating control is another feature



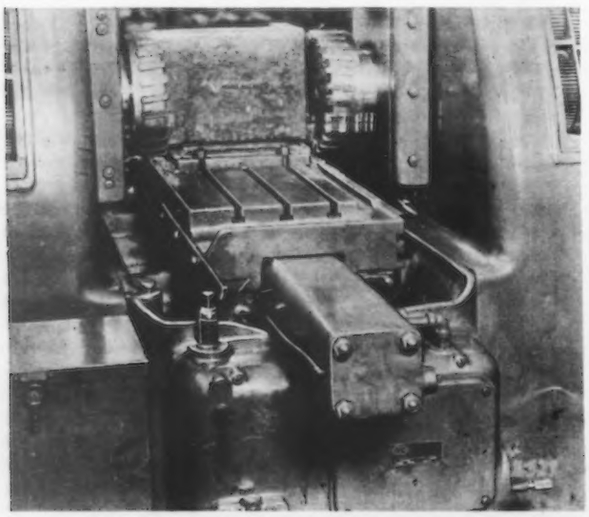
Both Plain and Duplex Types Are Built. The design permits the application of multiple-spindle units, arranged horizontally, vertically or in combination

of sufficient length so that the overhanging of the table in its extreme positions never exceeds more than one-fourth of the table length.

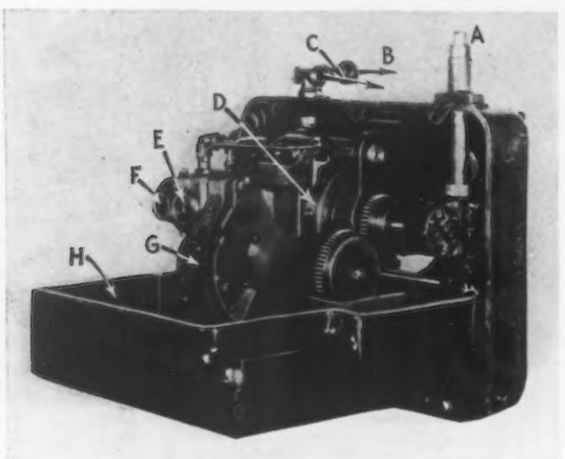
Operating Characteristics of Hydraulic Table Drive

In applying hydraulics to the reciprocation of the table of the machine the following operating characteristics are said to have been provided:

1. Reciprocation in either direction of normal feeding rates.
2. Reciprocation in either direction of rapid traverse rates.
3. Positive control of feeding movement regardless of the direction or amount of the resultant cutting force.
4. A locked condition of the table when in the stopped position, thus rendering it incapable of movement under the action of the cutter.
5. The ability for accurate reversal of the table under any cutting condition.
6. Conveniently controlled acceleration or deceleration of the feed rate during a cut.
7. Economical operation.



The Mounting of the Pump Unit at the End of the Bed Is Shown Above

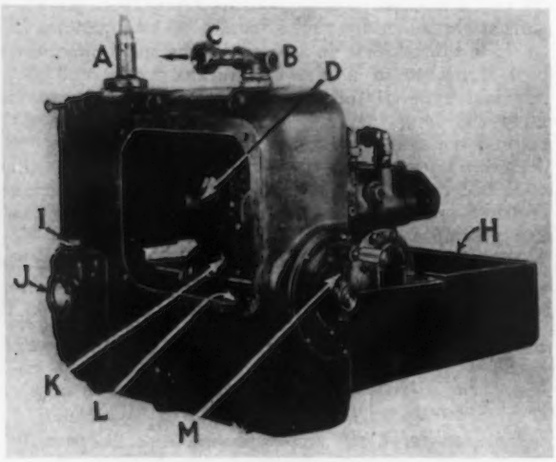


These operating characteristics have been obtained by the use of a special combination of pumps and auxiliary devices arranged to provide a locked control system.

Two hydraulic circuits, one for feeding and the other for rapid traverse, are employed. The elements in the feeding circuit include a cylinder bolted to the bed and carrying a sliding piston connected to the table by a piston rod. There is also a reversing valve, an Oilgear variable-displacement pump, and a small high-pressure booster pump working with the latter to produce a continued forward pressure upon the piston, the amount of this pressure being determined by the setting of a relief valve.

The space within the cylinder on both sides of the piston is at all times completely filled with oil; consequently, in order that the piston may be moved in a given direction by means of the forward pressure, it is necessary that the oil on the other side be able to escape. If no escape is permitted there will be no movement of the piston; if escape of oil is permitted, then the piston will advance just as fast as the escaping oil will allow it, and with a positively-controlled escapement the rate of advance is virtually independent of the amount of forward pressure applied.

In the arrangement employed the only avenue of escape for the oil from the rear end of the cylinder is through a pipe and reversing valve; thence through the Oilgear pump. Consequently, the quantity of oil permitted to escape from the cylinder is definitely fixed by the displacement of the Oilgear pump. The displacement of this pump may be varied at will from zero to maximum, the forward rate of the table being likewise readily varied from zero to maximum. Furthermore, the feed rate is determined not by the amount of oil fed to the cylinder, but by the amount permitted to escape from the discharge end. In this way a high back pressure is built up to resist the movement of the piston, thus providing a constantly receding restraint.



The Pump Unit and Connections Are Shown Above and at Left, Respectively. The cam feed control plunger is at A; the outlet to the right-hand cylinder end at B; the outlet to the left-hand cylinder end at C; the Oilgear pump at D; the selector valve at E; the stop valve for reciprocating cycle at F; the booster and rapid traverse pump at G, and the oil reservoir at H. The filling plug is at I; the oil level gage at J; the high-pressure relief valve at K; the emergency relief valve for rapid traverse at L, and the feed rate control lever for hand control at M

The amount of this back pressure is not constant, but varies with the direction and amount of the resultant cutting force.

To provide a high table speed for rapid approach to the work and rapid return, use is made of an auxiliary, large-volume, low-pressure gear pump.

Although for the sake of simplicity the feeding and rapid-traverse circuits have been separately described, in actual practice both circuits are interconnected and operated by a common control or selector valve arranged to provide both a reversal of table movement and a change of speed from feed rate to rapid traverse, or vice versa. This is accomplished by the use of a valve having both reciprocatory and oscillatory motion.

Advantages from Hydraulic Feed

An outstanding advantage claimed for the use of the hydraulic feed is flexibility of feed control. Features provided, as listed by the company, are: 1.—Any desired feed rate from zero to maximum accomplished merely by the setting of the pendulum of the variable-displacement pump from zero to maximum. 2.—Automatic change of feed rate during cut, if desired, providing maximum metal removal. 3.—Any desired cycle of feed and quick traverse in either direction together with automatic stop or feed change at any point. 4.—

Possibility of milling in a given direction until the table encounters a positive stop, then dwelling to allow cutter to clear itself, and after a predetermined interval of time automatically returning the table at a rapid traverse rate. 5.—Accuracy of trip.

Item 2, it is pointed out, is particularly valuable in production operation wherever the width of piece to be milled is not uniform throughout its length. Under existing practice it is necessary to limit the feed rate for the entire piece by the proper rate for the widest part, whereas with the hydraulic system a simple cam may be arranged to automatically adjust the feed rate to the amount desired for each successive table position.

Another advantage claimed for the hydraulic feed is longer cutter life. In this connection it is stated that in the application of hydraulics to broaches, drilling machines, and other machine tools an outstanding characteristic has been a marked increase in the life of the tool. The same effect is said to have been found to exist in the case of the hydraulic-feed milling machine.

A third advantage cited for the hydraulic feed is higher efficiency of metal removal. Tests covering a wide variety of work have been made, and data relating to this investigation, together with data on cutter life and chip formation, will be made available later.

Another advantage claimed is safety, the entire feeding transmission being automatically safeguarded against overloading by the action of the various relief and control valves. Simplicity is another feature emphasized.

Self-Contained Drive Arrangement

The drive is through a motor, inclosed in the housing, to the initial drive shaft by means of a silent chain which is automatically lubricated. This initial shaft carries a multiple disk friction clutch and a set of bevel gears for changing the direction of spindle rotation. These members constitute a self-contained unit provided with splash lubrication.

One of the bevel gears in the reverse mechanism is used as a driver of the vertical shaft from which, by means of a set of reduction bevel gears, the change gears are driven. These change gears are mounted solidly on the shaft by means of a steep taper and a locking nut facilitating their removal when speed changes have to be made. The second change gear shaft also carries the back gear pinion from which a large face gear is driven. This entire mechanism is lubricated by means of an oil pump continuously circulating oil over all bearings and gears.

All shafts, including the spindles, run on Timken roller bearings and the spindle itself runs on the company's four bearing self-compensating spindle mounting. The drive is designed to keep the high constant-speed transmission as close to the spindle as possible. It is claimed that by providing the change gears directly on the face-gear pinion shaft, a drive with maximum rigidity and minimum torque has been provided. Only four gear contacts are on the drive.

Operating levers are located conveniently. A starting lever operates the friction clutch and brake. A second lever controls the feeding mechanism; this has four positions, two of which result in power quick traverse of the table in either direction, while the other two positions give a feed to the table in either direction. The positions of this lever indicate the direction in which the table is moving. A third lever starts and stops the table movement, whether fast or slow. Automatic control of the table is similar to that used on the company's mechanically-operated automatic milling machine.

Adjustments for setting up the machine, such as raising and lowering the spindle carrier, the in-and-out adjustment of the quill are made from one position. All bolts for loosening and tightening the various elements can be operated with a single wrench in the same position.

All running parts, including the table, are automatically oiled and do not need attention more than once a month. Only one place on the machine requires the conventional daily oiling.

Steel vs. Reinforced Concrete for Bridges

Advantages of Steel Include Known Durability, Rapid Erection and Use of Materials Tested Beforehand

SOME of the comparative qualities of steel and concrete for bridges were covered in an address by Dr. Ralph Modjeski, consulting bridge engineer, New York, at the fifth annual convention of the American Institute of Steel Construction. A portion of his paper follows:

The proposed bridges at Tacony over the Delaware River near Philadelphia, as well as the one at Louisville over the Ohio River, will be of steel. The first one, aside from its long navigation span and its bascule span, will be composed of short steel lattice girders. The second will be a series of steel arches. In both bridges reinforced concrete arches would have been possible but the engineers chose steel because of:

1. Possibility of erecting the superstructure by cantilever method or with little falsework, whereas concrete arches would require heavy centering and be in danger from floods.
2. Much more rapid erection of the steel spans.
3. Continuous work during winter.
4. Certainty of calculations, etc.

As yet we do not know how long the reinforced concrete structures already built will last. We know that steel will last indefinitely if properly designed, cared for and protected. The Menai Bridge in England, an eyebar chain suspension bridge, lasted over 100 years. There are link suspension bridges in China which are believed to have lasted for centuries.

There is no doubt as to the value of good, dense concrete as a lasting protection for steel against corrosion. This has been fully demonstrated and is one of its most valuable properties. But there is grave doubt whether the steel in tension flanges of reinforced concrete beams will not be exposed to oxidation through the cracks in its shell of concrete, since, as remarked before, the concrete being practically inelastic, is bound to crack under tension.

Alloy Steels Coming into Larger Use

We are now in the era of steel alloys for construction use. Chrome-steel was used in the Eads Bridge at St. Louis. Later nickel and silicon-steel were introduced and widely used. Mayari steel, of a natural Cuban ore, containing both chrome and nickel, was used in the Harahan Bridge at Memphis. Copper-bearing steel is now being talked of as a suitable material for structural purposes. It is said to be less subject to corrosion than ordinary steel.

We may expect still greater progress in the alloy steels and their application to engineering structures. The discovery of an absolutely rustless and not too expensive alloy, which would still retain its physical properties of strength and the resilience now obtained in steel, is probable. When this occurs we shall have an absolutely perfect material of construction requiring no painting or other protection from the elements, besides being absolutely reliable and durable.

Even now, with the steel subject to rust if not properly taken care of, we do not often hear of steel structures being replaced because of deterioration. Most replacements are necessary because of increases in loading or because of other conditions making alterations necessary. And it may be added that alterations in structural steel are much more easily accomplished than in reinforced concrete.

Sand-Condition Plant Saves Labor

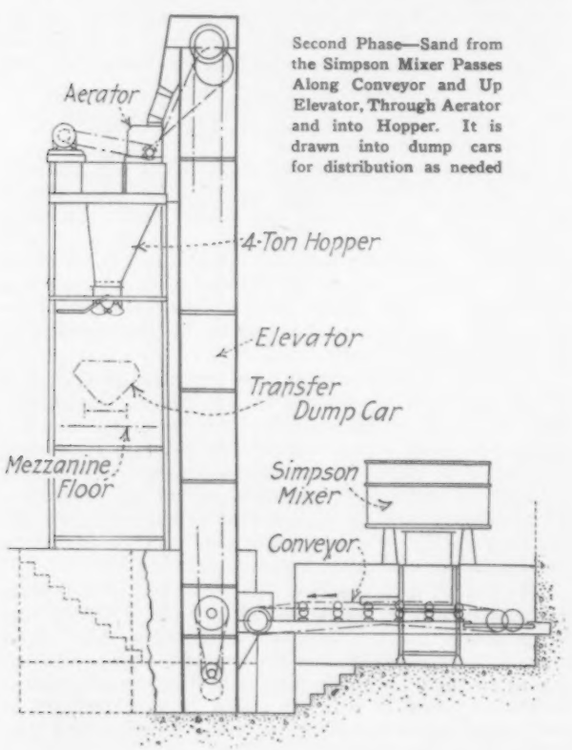
Combination of Conveyors and Elevators Reduces Time 20 Per Cent—Smoother Castings Reported

REDUCTION of 20 per cent in the time required to prepare sand is reported to have been effected in the gray iron foundry of James B. Clow & Sons Co., Newcomerstown, Ohio, by the installation of a new sand preparation plant. Since the process has been in operation the castings produced by the company have been smoother and are more easily cleaned. The percentage of defective castings has been materially decreased, while the labor of three men has been eliminated.

Faster and more thorough preparation of sand has made it possible to place all of the backing sand necessary for the day's work in the storage bins in a few hours. Then the equipment is free to be used for facing the sand. The result is the saving of one mixer and of one workman.

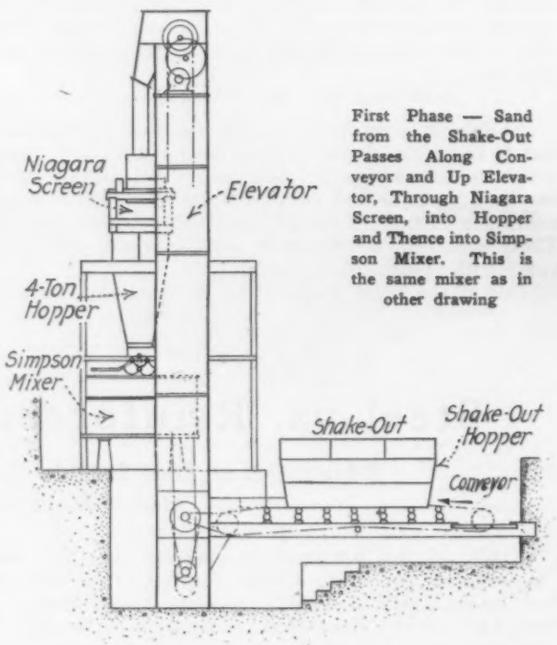
Flasks are shaken out on a steel shake-out hopper 11 ft. wide and 8 ft. deep, having a hinged bar grating of 2-in. x 10-in. mesh, the hopper being elevated 18 in. above the floor level. The radiator loops, sprues and large cores are held on the grating. The sand passing through the hopper drops on to a horizontal belt conveyor 24 in. wide, operating at 30 ft. a minute. The conveyor carries it a distance of 9 ft. to a bucket elevator.

The elevator takes the sand upward about 30 ft. and dumps it into a chute leading to a No. 2 Niagara screen, which screens out the small pieces of metal. From this point the sand falls into a four-ton hopper with clamshell valves, and thence into a Simpson mixer. After passing through the mixer, it is deposited on a second horizontal belt conveyor similar to the one already described. This conveyor takes the sand to a second elevator paralleling the first one, and like it in construction.



Second Phase—Sand from the Simpson Mixer Passes Along Conveyor and Up Elevator, Through Aerator and into Hopper. It is drawn into dump cars for distribution as needed

Again the sand is elevated approximately 30 ft. and is dumped into a Jeffrey sand conditioner. This consists of a revolving studded roll running at 900 r.p.m. and operating against a series of adjustable wire brushes. The combined action of the roll and the brushes completely disintegrates and aerates the sand. From the conditioner the sand passes down into another four-ton hopper, with clamshell valves of the toggle type, which in turn empties into dump cars on the mezzanine floor of the foundry. The cars then transport the prepared sand to bins which are located directly over the molders' benches.



First Phase — Sand from the Shake-Out Passes Along Conveyor and Up Elevator, Through Niagara Screen, into Hopper and Thence into Simpson Mixer. This is the same mixer as in other drawing

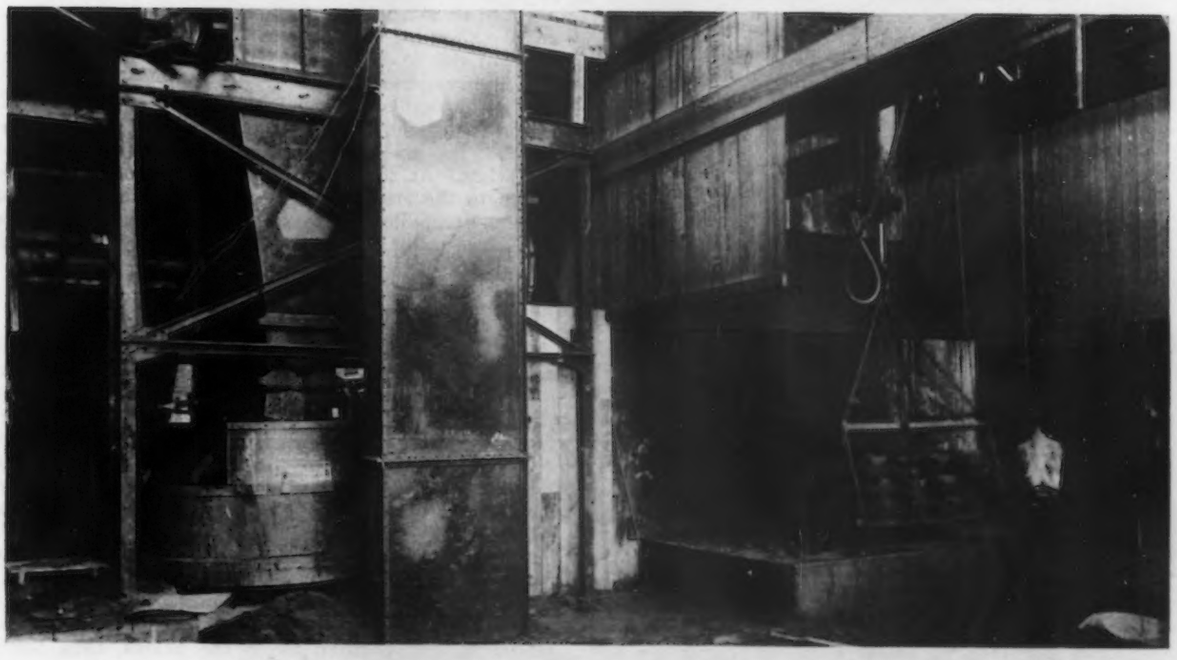
Under the new method of preparation, the sand shows a moisture variation of only 1 per cent, averaging 50 vent, American Foundrymen's Association test, whereas the old sand averaged 100 vent. On the other hand, the green sand strength reveals 150 in the A. F. A. test, against the former average of 100. It is expected that this contrast will become greater as the foundry becomes better adjusted to the operation of the new sand preparation plant.

Moreover, installation of the steel shake-out hopper brought about a considerable saving. The old wooden hopper formerly used was level with the floor, and it was necessary to shovel a portion of the sand into it. To shake out 1800 flasks, or 180 tons of sand, required the services of four men working a total of 7½ hours. Now only three men are needed, and they are able to complete the job in 6 hours.

The steel shake-out hopper, the two belt conveyors, the two bucket elevators and the two four-ton hoppers with clamshell valves were supplied by the Jeffrey Mfg. Co., Columbus, Ohio.

SAND Conditioner Consists of a Revolving Studded Roll Running at 900 r.p.m. and Operating Against a Series of Adjustable Wire Brushes (Right)

From the Conditioner the Sand Passes Down into Another 4-Ton Hopper, (Bottom of Page) with Clamshell Valves of the Toggle Type, Which in Turn Empties into Dump Cars on the Mezzanine Floor of the Foundry. The second bucket elevator, inclosed, is at right of dump car



FLASKS Are Shaken Out on a Steel Shake-out Hopper (Above), 11-ft. Wide and 8-ft. Deep, Having a 2-in. x 10-in. Mesh Hinged Bar Grating, the Hopper Being Elevated 18-in. Above the Floor Level. The radiator loops, sprues and large cores are held on the grating. The first bucket elevator appears in center and the Simpson mixer at left of it

Standard Sections in Steel House

Frame and Partitions of Standard Structural Shapes, Rafters of Wood and Interior and Exterior Sheathing of Gypsum Board Are Features of Cleveland Residence

STANDARD channel sections have replaced beam sections, previously used for studs and joists, in the third steel frame house to be erected by S. R. McKay, of the McKay Fireproof Construction Co., Cleveland. The first house of the McKay type was built about a year ago. Since that time the original design of the steel frame has been changed somewhat and in the house just completed at Cleveland the frame is made entirely of standard structural shapes.

Costs Made a Leading Consideration

This house, shown in the accompanying illustrations, is 26 x 26 ft. with a 10-ft. wing used for a breakfast room. The steel frame fabricated and delivered cost $583.72. The labor cost in erection amounted to $105.75, and the cost of the steel used for the partitions delivered and fabricated was $85.73. This made the total cost of the steel frame and partitions $775.20, and after completion the house was sold for $15,000.

Better construction of residences was the main object Mr. McKay sought to attain in designing his type of steel frame house. Elimination of shrinkage, assuring level floors, preventing wall cracks and making possible a factory built house with the detail work done in the shop and actual erection largely assembling work, was sought, although protection against fire was not given large consideration. Costs were given particular attention in the design. The builder was not directly interested in finding a new outlet for structural steel and did not attempt to use a large amount.

Flexible Framing a Feature

The McKay type of house is designed on the unit system so that the same framing plan may be used for any number of houses not having a great deal of similarity in outside appearance. Flexible framing is an outstanding feature of the design. The framing of the doors and windows is adjustable so that it can be made to fit the architect's plans. A difficulty met in building steel frame houses, especially brick houses, it is pointed out, is in detailing the steel framing and establishing the window and door openings as shown by the architect's plans. With adjustable steel frames the window framing can be moved to work out the true bond for brick work. Otherwise it would be necessary to cut small pieces of brick alongside the window frames, which would detract from the appearance of the house. With the McKay system full-sized brick can be used at the side of the frames.

The rafters are of wood. Because steel roof framing is said to require rather complicated detailing it was decided to limit the steel construction to the house frame. From the standpoint of fire protection it is claimed that nearly all the fires in residences start below the top floor and for that reason a house with wood rafters is nearly as fireproof as one with steel roof framing. A feature of the house is the use of gypsum board for both exterior sheathing and interior covering. This takes the place of plaster work. The sheathing also acts as fireproofing for the steel.

Floor Joists on 4-ft. Centers

The size of the floor joists depends upon the span. They are placed on 4-ft. centers and rest at one end on 6 x 6 x ¼-in. bed plates that are anchored in the foundation, and on the other end on a center girder which is embedded in the foundation so that it is flush with the bed plates. At the corners 10 x 10-in. bed plates are used. The studs are 4-in. channels placed on 4-ft. centers. Each corner post is made of two 4-in. channels with the same punchings as the studs. These corner members are riveted together with 2 x 2-in. angles. Both the regular studs and the corner posts are cut for each story.

To each end of the channel stud is riveted a ¼-in. plate, these plates extending 2½ in. below the bottom and 2½ in. above the top of the channel. The studs rest on the top of the first floor joists and the plate riveted to the lower end of the stud is bolted to the joist. The studs are braced by 3 x 3 x ⅛-in. angles punched on 4-in. centers which are bolted to the studs and floor beams. This bracing assures a positive alinement of the studs and a 4-ft. centering for locking of 4-ft. gypsum board used for sheathing.

On the first and second floor angles are placed on the inside of the studs. At the top of the studs or at the roof line these angles are placed on the outside of the studs. At this point a 2 x 4-in. wood member is bolted to the steel channel and to this the wood roof rafters are nailed. The second and third floor joists are bolted into the studs in the same way as the first floor joists.

Framing of Windows

In the framing of windows and doors where it is necessary to remove one or more of the 4-in. channel studs a 3-in. I-beam is placed horizontally between the studs above the first and second floor joists and underneath the second and third floor joists. These are set in the proper position to allow space for the windows. Between these beams 4-in. channels are set vertically. Riveted to each end of the channel is a 2 x 2-in. angle lug. The other end of the lug has two 7/16-in. holes punched on 2⅞-in. centers so located that they come on the outside of the flanges of the 3-in. I-beams. The channels are clamped to the flanges of the top and bottom I-beams by means of four clips and can be placed in any position along the beams, thus being adjustable for a window or door of any size. When the channels are in the required position they are bolted to the horizontal I-beams. The top I-beam or header is bolted to either the second or third floor joist above.

With this construction the window and door channels fit tightly between the top of the 3-in. I-beam headers and act as a support for the 3-in. I-beam that is carrying the channel floor joist. The 3-in. I-beams used in the window and door framing are cut in standard lengths of 8 ft., 12 ft. and 16 ft., the lengths used depending on the number of studs removed for window or door openings. On the outer side of the window channels 2 x 4-in. wood members are fastened with lag screws that are driven through holes punched in the channels during fabrication. Frames, door jambs and interior woodwork are nailed to these wood sections.

On two sides of the house on which the studs carry no load but must be placed to provide the proper thickness of wall to receive the window frames and doors, the studs are clamped over the end of the floor joists, making them adjustable. This permits them to be moved along the floor joists to positions that will allow the placing of the doors and windows in positions shown by the plans. When in place the clamps are bolted to assure rigid connection with the studs and floor joists. When a window or door is located between two studs

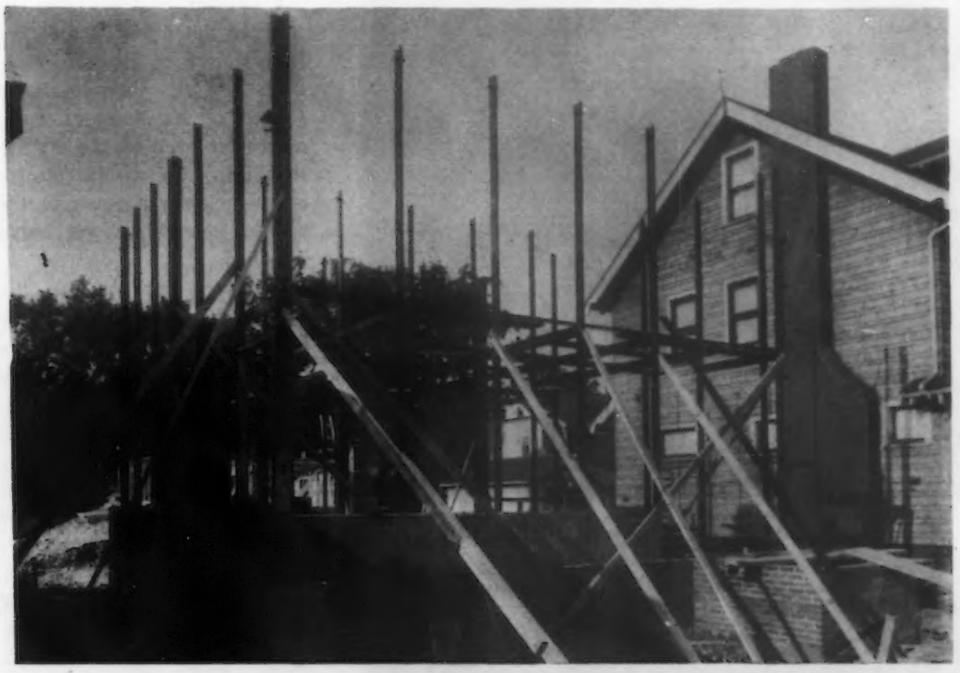
2 x 4-in. wood sections are screwed to the studs for nailing the door and window frames and inside trim.

Wood Sections Between Joists and Floors

When the roof is inclosed and the window sashes are in place 2 x 4-in. wood sections are laid on the floor joists on 16-in. centers and are screwed to the flanges of the steel channel joists. Then the floor is laid in the usual manner, no attention being paid to the partitions. The use of wood sections between the joists and floors permits the laying of pipes above the steel floor joists and the installation of wiring without cutting or burning the joists. In doing the electrical work the wiring is attached to the wood members and kept 2 in. from the steel sections, as required by the National Board of Fire Underwriters.

After the wiring and piping are in place ¾-in. gypsum board is placed on the ceiling and outer walls. Three-inch channels spaced on 4-ft. centers are used for partitions. These have 2 x 2-in. angle lugs at each end. Each center partition is screwed into the wood floor and to the gypsum board on the ceiling by lag screws. Where there are door openings 2 x 3-in. wood sections are screwed to the channels for hanging the doors and nailing the trim.

The gypsum board used for outside sheathing is applied in 2 x 4-ft. sheets ¾ in. thick. Metal clips are used to attach this to the steel frame. The gypsum board in 4 x 8-ft. or 4 x 4-ft. sections is fastened to the interior walls, partitions and ceiling in a similar manner. After the walls are covered the joints are filled and sanded, leaving a smooth flat surface which may be decorated as desired. The outside wall covering may be brick, stone, wood or stucco.



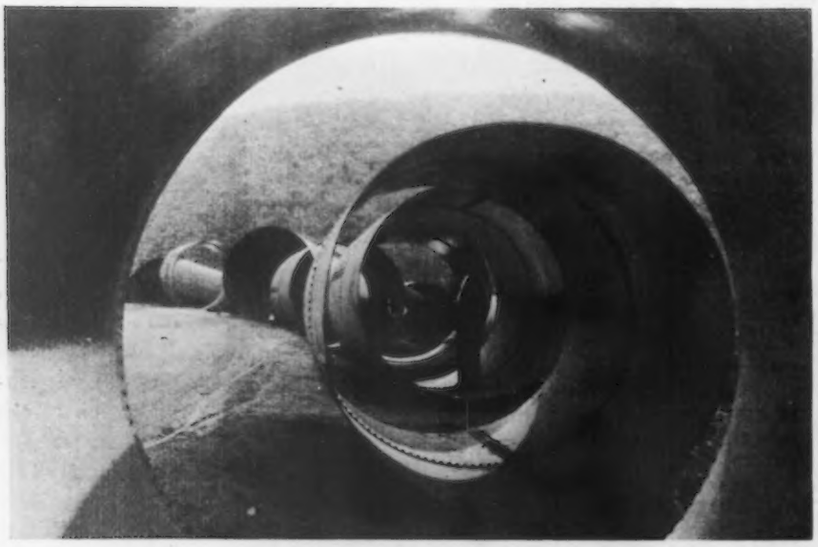
Steel Frame Before Completion, Showing the Way the Gypsum Sheathing Is Applied and the Start in the Exterior Brick Work

First Floor After Framing Is Finished. Window frames and sash are set, piping and wiring have been installed and the wood floors have been laid

Oil Burner Men to Meet in Chicago in April

Announcement is made of the fifth annual convention and exposition of the American Oil Burner Association, which will be held at the Hotel Stevens, Chicago, on April 3, 4 and 5. Reservations for space have already been made by a number of companies. Arrangements are being made to care for an attendance of about 2500, which will be a large increase over the attendance at the Buffalo convention last spring. Applicants for space should communicate with the secretary, Leod D. Becker, 350 Madison Avenue, New York.

Sao Paulo, Brazil, is Building a Water Supply



AN interesting engineering project is under development at Sao Paulo, the second largest city in Brazil. Aqueducts and pipe lines to supply 66 gal. or 250 liters of water a day for each of the 800,000 inhabitants and to provide for a future growth equal to the present population are being installed.

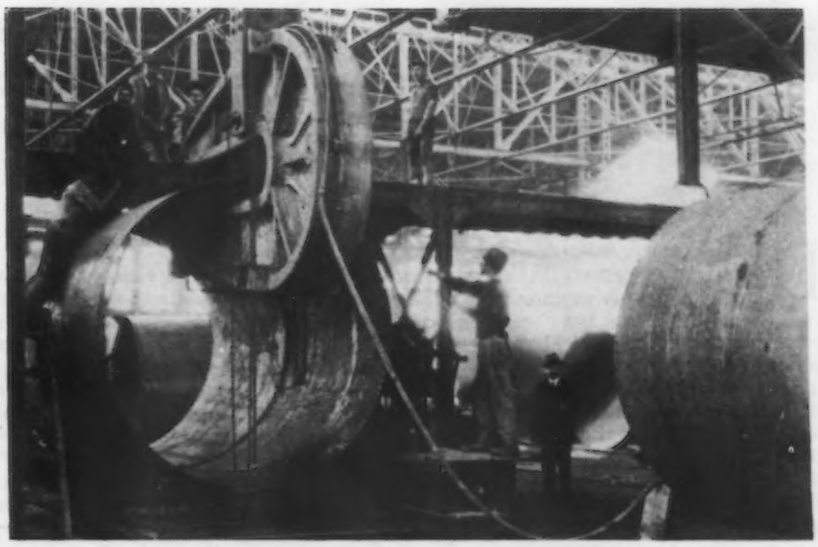
From a dam on the Rio Claro, 46 miles from Sao Paulo, water will be carried through a pipe line of iron plates and aqueducts of reinforced concrete. The siphon sections are of the iron plate pipes, riveted, and total 20 miles in length. Some 5 miles of the pipe is 98 in. in diameter built of plates ½ in. thick and subject to maximum pressure of 57 lb. per sq. in. There is 15 miles of pipe with a diameter of 71 in. built of 7/16-in. plates and subject to 114 lb. pressure. In all, 22,000 tons of metal will be required. Three reservoirs are under construction, the largest with a capacity of 72,000 cu. m. and the others each with a capacity of 26,000 cu. m.

ON this page are shown sections of the 2.5 meter Armco ingot iron siphons in the field prior to assembling and sections bolted together ready for the field riveting.

Line Taking 22,000 Tons of Ingot Iron Plates

The regions covered are mountainous, very sparsely settled and covered with dense vegetation. A roadway of 93 miles is required to handle the heavy traffic. The engineer in charge of this work is Dr. Henrique de Novaes, a native of Brazil. After graduating from the Rio Polytechnic School in civil engineering, where he won the first prize, a free educational trip abroad, Dr. Novaes served the federal reclamation service as assistant engineer; the Rio Grande do Norte Railroad as assistant resident engineer, and the Rio Light & Power Co. in its hydraulic construction.

Braithwaite & Co., Ltd., London, England, which has the contract for the construction work, built an assembly plant near Sao Paulo. Here the plates are rolled into complete lengths, and three or more lengths are hydraulically riveted together to form tubes. They are pneumatically calked and are given a coat of "Bowranite" bituminous paint, both internally and externally.



AT the top may be seen the riveting done at the assembly plant near Sao Paulo, where the plates are rolled into cylindrical form, and the other views show general field conditions.

Steels Best for Nitrogen Fixation

Two Per Cent Chromium Sufficient to Stop Deep Fissuring and Confine Deterioration to Thin Surface Layer of Steel

BY J. G. THOMPSON*

DESIGN and construction of apparatus for the fixation of atmospheric nitrogen by modern methods, involving the use of high pressures and high temperatures, has required considerable engineering and metallurgical research. Handling gases under pressures ranging up to 1500 atmospheres (22,500 lb. per sq. in.) presents many engineering difficulties and the problems were further complicated by the lack of data on the strength and other properties of structural materials at the elevated temperatures, up to 500 deg. C., employed in the process. Furthermore, it was soon evident that many of the common structural materials rapidly deteriorated and soon failed in service in either the synthesis or cracking of ammonia. The serious consequences of sudden failure in a system containing large quantities of hydrogen under high pressures and at temperatures above the kindling point of the gas, are obvious. Accordingly, an investigation was started, and is still in progress at this laboratory, searching for the metal or metals which would possess the desired physical characteristics and which would best retain these characteristics when exposed to gaseous systems containing hydrogen, nitrogen and ammonia. Results so far attained will be given in detail in a forthcoming publication from the United States Bureau of Standards, by Vanick, de Sveshnikoff and the writer.

It was quickly demonstrated that wrought iron, mild steel, copper, nickel and various alloys all deteriorated rapidly from intergranular or intercrystalline fissuring. The metallic grains themselves were not appreciably attacked and the surface of the metal, where the attack originated, was seldom affected enough to indicate the severity of the attack in the interior of the specimen. As an example of the rapidity of deterioration sometimes encountered, the wall of a seamless copper tube, 0.15 in. thick, was completely riddled in six days' service as a catalyst well.

In these early tests, the results of which have appeared in two papers,† the most promising results were obtained from a chromium-nickel-iron-silicon alloy and this led to a systematic study of a number of alloy steels.

The first series consisted of ten forging, carburizing and tool steels, as listed in the table. The specimens, carefully annealed, were made up in the form of hollow test cylinders as shown in Fig. 1. The cavity in each cylinder was large enough to accommodate two tensile, two Charpy impact, and two small corrosion plugs. The cylinders were connected in series and were exposed to conditions representative of the synthesis of ammonia, i.e., were exposed to the action of a gas consisting of 3 parts of hydrogen and 1 part of nitrogen, this mixture containing 8.3 per cent ammonia, at 100 atmospheres pressure and 500 deg. C. The exposure was continued for four months, after which specimens cut from the cylinder walls as well as those stored inside the bombs, were tested in tension and impact, and subjected to microscopic and macroscopic examination. It was soon evident that no one test would explain, satisfactorily, all the observed phenomena but that final judgment could be rendered only on the basis of a composite of data from all the tests.

In general a marked decrease in strength and ductility of the specimens resulted. Decarbonization and fissuring occur, usually together but sometimes independently, and varying widely in severity. Two types of penetration were observed, a regular, uniform inward migration, and a selective, "tendril" type of advance, the latter being harder to detect and evaluate. The penetrated area sometimes extended to the core of the samples. The progress of fissures along slag prills was frequently noted.

Fig. 1—Test Cylinder and Gas Connections; Approximately 15 In. Long Overall

A summary of all the evidence showed that:

The tungsten-chromium steel, No. 39, was the least affected of any in this group. Except for intergranular fissures close to the surface of this specimen, as shown in Fig. 2, there was very little evidence of attack by the gases, notwithstanding an initially high carbon content (which subsequent tests would indicate is detrimental).

The chromium steels, within the range of chromium studied in this series, all suffered from the treacherous tendril form of penetration, as shown in Fig. 3. It appeared, however, that the resistance to penetration increased with increasing alloy content, although in some cases this beneficial effect was wholly or partly nullified by an increase in carbon.

Composition of Ten Steels First Studied

Sample No.	S.A.E. Specification No.	C	Mn	P	S	Si	Cr	Ni	Others
31	1,020	0.19	0.43	0.008	0.033	0.17	...	...	...
32	1,095	1.01	0.40	0.007	0.036	0.16	...	...	...
33	2,330	0.24	0.52	0.008	0.032	0.03	...	3.43	...
34	6,130	0.30	0.68	0.012	0.024	0.26	0.93	...	0.18 V
35	3,335	0.39	0.70	0.011	0.044	0.29	0.84	3.56	...
36	3,230	0.27	0.59	0.014	0.022	0.13	1.00	1.60	...
37	52,100	0.93	0.30	0.010	0.014	0.21	1.47	...	...
38	5,140	0.48	0.79	0.030	0.029	0.23	0.60	...	...
39	7,260	0.58	0.36	0.004	0.017	...	0.55	0.21	1.62 W
40	2,512	0.10	0.31	0.008	0.023	0.31	...	4.87	...

*Bureau of Chemistry and Soils, United States Department of Agriculture. Published by permission of the Director.

†J. S. Vanick: Transactions American Society for Steel Treating, Vol. 4, page 62 (1923) Proceedings American Society for Testing Materials, Vol. 24, page 348 (1924).

Microstructure of Specimens from First Series, After Exposure for Four Months

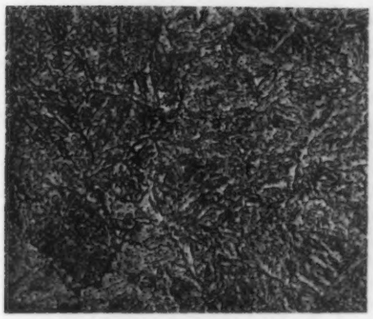


FIG 2

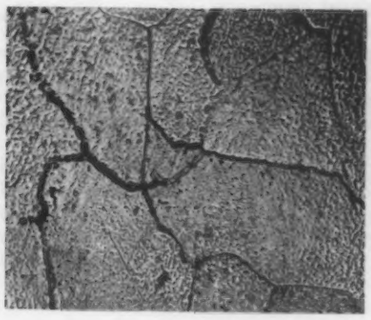


FIG. 3

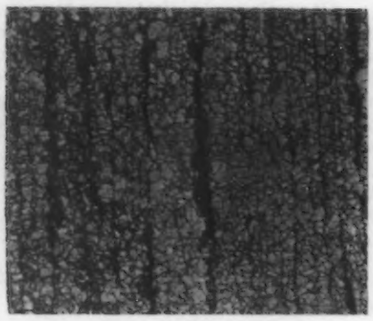


FIG. 4

Fig. 2—Slight Fissuring in Tungsten-Chromium Steel No. 39 Near Surface—500 Dia. Fig. 3—"Tendril" penetration and decarbonization in low chromium steel No. 37—100 dia. Fig. 4—Parallel fissuring in high nickel steel No. 40—50 dia.

In a comparison of the high and low carbon plain steels, there was less deterioration of the low carbon steels, although both high and low carbon samples were penetrated to their very centers after four months' exposure.

Nickel steels showed a distinctive type of selective fissuring, illustrated in Fig. 4, which reached to the core of the specimen in some of the four month exposures. The fissures were mainly concentric with the cylindrical wall and most of them were alined in one direction, so that a surprising amount of tensile strength was frequently found to remain in a deeply penetrated specimen.

Nickel-chromium steels reflected the influence of both elements.

Systematic Studies of Chromium-Vanadium Steels

The improved resistance of the higher chromium steels of the series just described, and the possibility of further improvement with still higher chromium contents, coupled with the commercial availability of chromium or chromium-vanadium steels, led to the choice of this type of steel for further tests. The compositions chosen, as shown in the table, represent three series, in each of which one of the three main constituents, carbon, chromium, or vanadium, is varied while the other two are maintained reasonably constant. Samples of the 0.30 carbon chromium-vanadium steel from the first series of tests were included in each of these later series for comparison purposes.

The samples were double annealed and shaped into bombs and specimens, which were exposed to 3:1 gas, containing 8.3 per cent ammonia, under 100 atmospheres pressure and at 500 deg. C., as in the preceding test. The exposure was continued for ten months after which the bombs and specimens were removed and subjected to tensile, impact, macroscopic and microscopic examination.

Either uniform or selective penetration were observed in this series. The carbon steels were deeply penetrated, as shown in Fig. 5, the deterioration increasing in severity as the carbon content increased. It was observed that consistent results for carbon steels could be obtained only from long exposures, since the high carbon steels showed greater initial resistance but, after penetration once began, they deteriorated more rapidly and completely than did the lower carbon specimens. Short exposures of a week or two may be badly misleading.

For the vanadium series, the data show that a threefold increase over the ordinary vanadium content of a 1.0 per cent chromium steel failed to improve significantly the resistance of the samples. All the vanadium steels suffered from selective penetration and fissuring,

Microstructure of Annealed Alloy Steels After Exposure for 10 Months

Fig. 5—Severe Fissuring and Decarbonization in High Carbon Steel No. 13—50 Dia. Fig. 6—Complete decarbonization and severe fissuring in vanadium steel No. 7—50 Dia. Fig. 7—Partial decarbonization and severe fissuring in high carbon steel No. 14—500 Dia. Fig. 8—Fissuring in the high chromium steels is confined to the shallow penetrated zones. Steel No. 27—100 dia.

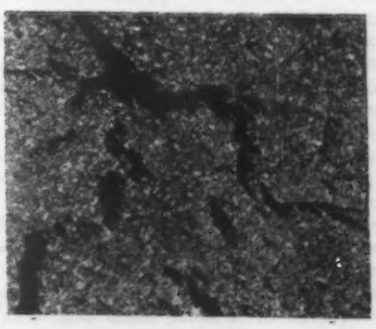


FIG. 5

FIG. 6

FIG. 7

FIG. 8

as shown in Fig. 5, and most of them were completely penetrated within 60 days.

All steels containing more than 2 per cent chromium resisted the action of the gases excellently. All other steels showed deep irregular zones of penetration and microscopic examination usually revealed the presence of fine irregular fissures extending appreciable distances further. Low chromium steels also showed the selective type of fissuring and deep penetration, illustrated in Fig. 7, but the attack on high chromium steels was confined to a shallow, uniform penetration, illustrated in Fig. 8, and this was limited to the surface layer, as far as macroscopic and microscopic examination could determine.

Two per cent or more of chromium seems to be necessary to retard the rate and to limit penetration to a uniform layer parallel to the surface, thus eliminating the selective, tendril type of progressive deterioration. The presence of more than 2 per cent chromium retarded the penetration still more, but not in direct proportion to the increase in chromium. For example, the 7.7 per cent chromium steel No. 5 was only slightly better than the 2 per cent steel No. 4.

Resistance May Be Due to Stable Chromium Nitride

Steels containing more than 7 per cent chromium were colored blue in contrast to the dull gray of the others. The blue coloration is ascribed to the formation of a nitride of chromium, dissolved or in solid solution at the surface of the metal and which in longer exposures penetrated measurable distances into the steel. Chemical analysis of thin layers of this dark colored solid solution from one specimen showed a nitrogen content of 0.59 per cent as compared to an original 0.016 per cent. Aside from this dark colored layer near the surface, the chromium steels showed no appreciable change in structure as a result of the prolonged heating at 500 deg. C.

Composition of Carbon-Chromium-Vanadium Steels Chosen for Second Series of Tests

Sample No.	C	Mn	P	S	Si	Cr	V
			Chromium Series				
1	0.37	0.39	0.017	0.022	0.27	0.04	0.19
2	0.29	0.53	0.015	0.011	0.16	0.51	0.28
3	0.30	0.68	0.012	0.024	0.26	0.93	0.18
4	0.31	0.48	0.011	0.011	0.12	2.01	0.34
5	0.33	0.37	0.028	0.013	0.26	7.70	0.18
6	0.42	0.35	0.025	0.009	0.06	14.40	0.18
27	0.25	0.40	0.020	0.020	0.60	13.50	...
28	0.48	0.09	0.018	0.014	0.43	21.10	0.07
			Vanadium Series				
7	0.40	0.53	0.018	0.013	0.18	1.05	0.02
8	0.37	0.52	0.018	0.018	0.20	1.05	0.07
9	0.35	0.37	0.020	0.013	0.20	1.02	0.14
10	0.37	0.55	0.018	0.019	0.18	1.07	0.31
11	0.27	0.34	0.025	0.011	0.29	1.24	0.65
			Carbon Series				
12	0.16	0.55	0.023	0.023	0.34	1.03	0.20
13	0.58	0.68	0.011	0.017	0.23	0.73	0.18
14	1.16	0.55	0.022	0.018	0.20	1.06	0.20

Four specimens of chromium steel No. 3 were heat treated in different ways before exposure to see if this would affect their resistance. The observed results were so irregular as to lead to the conclusion that heat treatment of a steel containing less than 2 per cent chromium would not produce satisfactory resistance.

The results obtained from this second series of chromium-carbon-vanadium steels, show that:

The carbon content must be low.

Two per cent or more of chromium is necessary to confine the fissuring and decarbonization to a uniform, shallow penetration.

Larger amounts of chromium improve resistance of the steel, but not in direct proportion to the increase in chromium.

High chromium and high chromium-nickel steels are most resistant, but are difficult to fabricate.

A suitable steel would contain at least 2.25 per cent chromium with not more than 0.30 per cent carbon.

Heat treatment is useful to dissolve alloys in steels inherently resistant and to render them more uniform in structure, but does not impart resistance to otherwise non-resistant steels.

Vanadium does not render steel resistant to the attack of the gases.

Discussion and Summary

These studies have shown conclusively that exposure of these steels in the conditions described causes decarbonization; fissuring, voiding, or porosity in the affected zones; lowered strength and ductility; and a sharp increase in combined nitrogen in the affected zones of the higher chromium steels. All of these features are evidence of the corrosive attack of the hot, compressed gases on the steels. Hydrogen, particularly active or atomic hydrogen from the catalytic formation and decomposition of ammonia (which reactions are continuously occurring at those temperatures and pressures) is undoubtedly the principal agent in the attack. Hydrogen filtering into the steel could accomplish the decarbonization and produce at least some of the fissuring. Preliminary attack by the hydrogen makes it easier for ammonia to penetrate the steel and to increase the destructive action already begun. While high concentrations of ammonia are known to attack steel, it would seem at first glance that the small concentration (8.3 per cent) present in these tests, might be inert. The failure to detect nitrogen or nitrides in the affected zones of most of the steels would support this assumption. However, the severity of the attack, which exceeds any observed for hydrogen and nitrogen alone, and the presence of nitrogen or nitrides in the higher chromium steels, demonstrate the attack by ammonia in some cases and indicate the probability of such attack through the formation of nitrides, in all cases. These nitrides, except chromium nitride, apparently are unstable under the existing conditions, but this formation and decomposition leaves behind a shattered, deteriorated structure.

The stable nitrides of chromium remaining in the steel structure, or the solid solution of nitrogen in the chromium-iron matrix, apparently are impermeable to the gases and prevent or greatly retard further attack on the higher chromium samples. Steels containing more than 2 per cent chromium were the only ones to show this nitride formation and the steels which formed this nitride layer all exhibited satisfactory resistance to the action of the gases.

All evidence to date points to the desirability of a low-carbon, chromium-rich steel for the construction of apparatus for the synthesis of ammonia.

Program for Refractories Meeting

In addition to the papers listed on page 1245 of THE IRON AGE of Nov. 3, other important topics will be discussed at the meeting of the American Refractories Institute, Hotel Chase, St. Louis, on Dec. 6 and 7. Among them will be a "Symposium on Tunnel Kilns," conducted by M. C. Booze, vice-president Charles Taylor's Sons Co., Cincinnati. "Simplification of Malleable Furnace Refractories" will be reported on by the joint committee on foundry refractories.

The opening address of J. M. McKinley, president of the institute and vice-president and general manager Crescent Refractories Co., Curwensville, Pa., will follow an address by Dr. E. R. Weidlein, director Mellon Institute of Industrial Research, Pittsburgh, and president American Institute of Chemical Engineers, with which organization the joint meeting of Dec. 6 will be held.

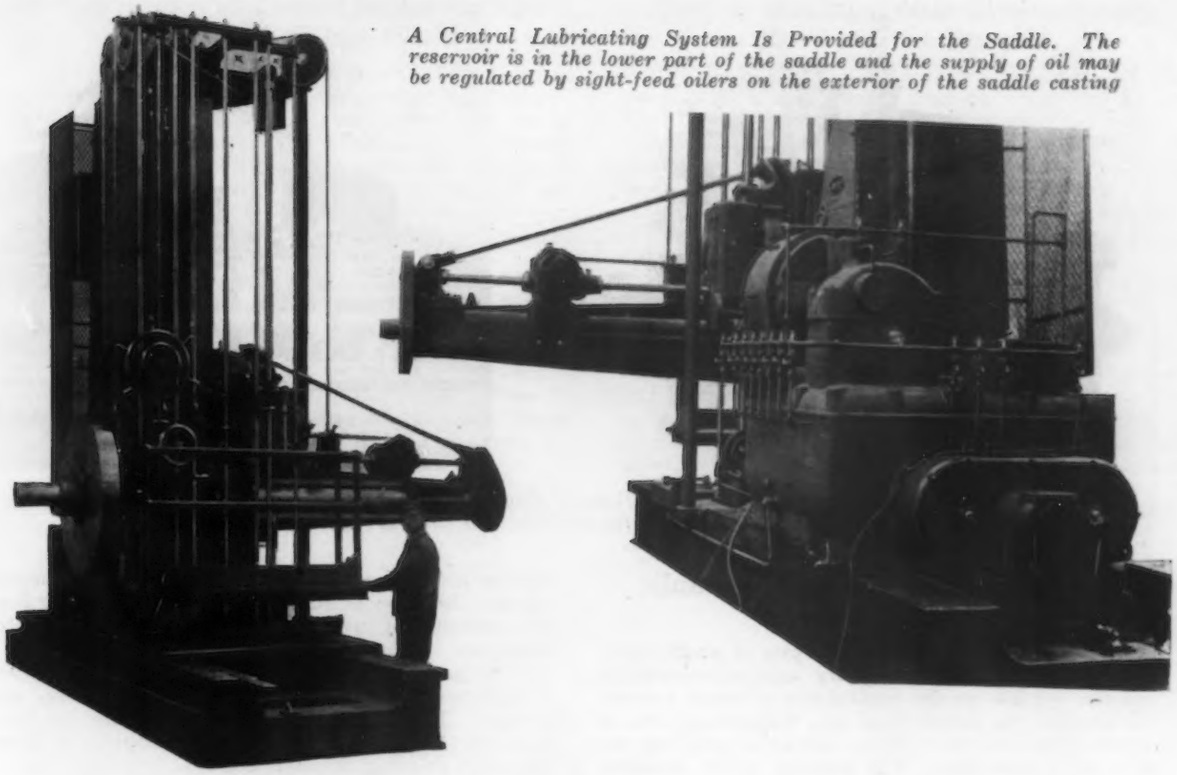
Meetings of Mechanical Engineers

Among meetings scheduled for various local sections of the American Society of Mechanical Engineers are the following:

Buffalo, Dec. 13—Hotel Statler at 8 p. m. Subject: Present Standing of the Various Standards now being Developed for Valves and Fittings for High Pressure Steam Service. Speaker: F. H. Morhead, chief engineer, Walworth Co.

Cleveland, Dec. 12—Cleveland Engineering Society Rooms, Carnegie Hall, at 8 p. m. Subject: Bethlehem Torque Amplifier and Lashlock. Speaker: Henry W. Nieman, inventor and engineer, Bethlehem Steel Co.

Tri-Cities, Dec. 8—Rock Island Arsenal Cafeteria, Rock Island, Ill., at 6.30 p. m. Subject: Centerless Grinding. Speaker: J. E. Caster, Cincinnati Grinders Corporation.



A Central Lubricating System Is Provided for the Saddle. The reservoir is in the lower part of the saddle and the supply of oil may be regulated by sight-feed oilers on the exterior of the saddle casting

Redesigns Horizontal Boring, Drilling and Milling Machines

INCLOSED saddle and drive box with automatic circulating lubrication system to all important gears, shafts and bearings is one feature of a redesigning line of horizontal boring, drilling and milling machines, which are being built by the Niles Tool Works division, Niles-Bement-Pond Co., 111 Broadway, New York.

Other features include drive and feed gears of steel; screw feed to the spindle; power rapid traverse to the spindle by separate motor; centralized grouping of controls; and scales inset on the face of the column and ways of the bed.

The machines are available in four sizes having spindle diameters of 6, 7, 8 and 10 in. respectively. The machine illustrated has a spindle 7 in. in diameter, with traverse of 72 in. The spindle, a high-carbon steel forging, has power feeds for drilling and boring, and feeds are reversible and positively driven by gearing and screw of large diameter. The thrust of screw in both directions is taken on ball bearings. For drilling and other operations requiring relatively high speeds, the spindle is driven through its sleeve; for boring large diameters and for milling, the drive is through a faceplate gear and pinion. Both hand and power rapid traverse are provided, also fine hand feed. Power traverse is by means of a 1-hp. motor mounted at the outer end of saddle and connected to spindle feed screw by gearing. When power traverse is engaged a clutch disconnects the feeding mechanism. Provision is made for locking spindle in the sleeve by means of a taper clamping bush.

The saddle is an oil-tight box with a cover that provides access to the driving and feed gears and other mechanism. It is provided with a central lubricating system, the oil being circulated by a pump driven by ¼-hp. motor to all gears and bearings. The supply of oil may be regulated by sight feed oilers on the exterior of saddle casting. The reservoir for oil is in the lower part of saddle. The saddle is held securely to the column by square locks and is gibbed inside the left-hand track of the column, forming a narrow guide. It has reversible power feeds for milling and power rapid traverse; also, hand adjustment for accurate setting. Thrust of vertical feed and traverse screw is taken on ball bearings. The counterweight for the saddle is at the rear of column and slides on rollers.

The column is a box casting mounted on a two-track bed and gibbed inside left-hand track to provide a narrow guide. It has reversible power feeds and traverse on the bed and fine hand adjustment. Saddle traverse on the column is regularly 96 in. but this may be increased. Column traverse on the bed is 120 in., but this may also be extended if desired. Scales are inset on the face of the column and on the ways of the bed to measure the vertical travel of saddle and horizontal travel of column.

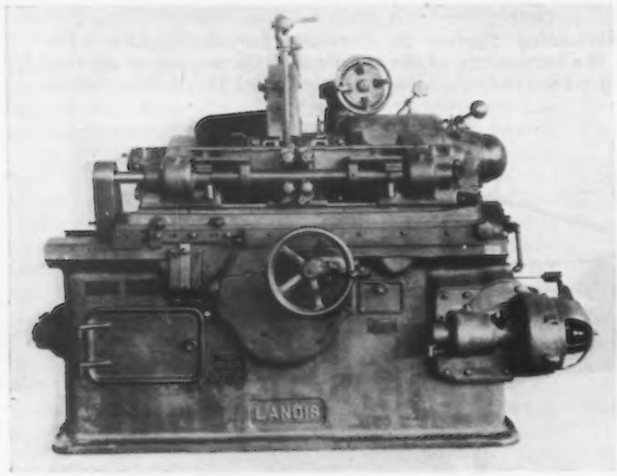
The machine is driven by a 15-hp. motor mounted on a gear box at the rear of column. The gear box is inclosed and has central lubricating system by pump connected to a ¼-hp. motor. The oil supplied to gears and bearings may be regulated by sight-feed oilers. The machine may be driven by a d.c. variable-speed motor, as illustrated, or by an a.c. constant-speed motor through the gear box, giving eight mechanical changes of speed.

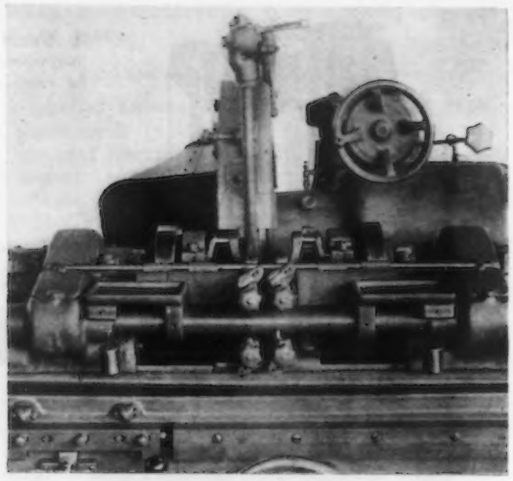
Operating levers for the saddle and column are mounted on the saddle and controlled from a platform attached to saddle and traveling with it. A floor plate may be furnished and an outboard column, either plain or mounted on the sub-base. Scales are provided for all movements on outboard column and sub-base. Circular tables with either hand or power rotary feed may also be furnished.

Annual Report of Secretary of Commerce

In making the fifteenth annual report of the Department of Commerce, Secretary Hoover presents his usual economic review covering prices, agriculture, building construction, transportation, banking and the foreign trade. He treats the growth of national efficiency, the increase in the standards of living, elimination of waste and the development of American aviation.

The greater portion of the 352-page volume is taken up with condensed reports of the various bureaus into which the department is divided. Copies of the report may be obtained at 30c. each from the Superintendent of Documents, Government Printing Office, Washington.





Pins of Small Motorcycle, Refrigerator or Stationary Engine Crankshafts Are Ground on a Production Basis. On double-throw shafts the two end pins are ground first.

Crankpin Grinder With Hydraulic Wheel Feed

For production grinding of the pins of small motorcycle, refrigerator or stationary engine crankshafts, and also for use on the crankshafts of small automobile engines, the Landis Tool Co., Waynesboro, Pa., is bringing out the 10- x 16-in. hydraulic grinding machine here reproduced. The machine is also available in the 10- x 32-in. size.

Simplicity of operation is a feature. On double-throw crankshafts the two end pins are ground first, simply truing out from the rough forging, using a spacing bar and supporting each end pin with a work rest. When the center pins are ground a locating bracket is attached to the right-hand head, the spacing bar is changed and the work rests are moved to the two center pins. The locating bracket is intended to enable the operator to quickly get the inside pins on center before clamping the work in the carrying fixtures, while the spacing bar facilitates positioning the work carriage with relation to the pin which is to be ground.

The work is driven from both ends through silent chains and sprockets, power for the work driveshaft being supplied from the rear drive through a belt and several sets of silent chains and sprockets. Mechanical clamps hold the work in accurately ground clamping blocks. Rotation of the work, which is at 100 r.p.m., is controlled by a single lever at the front of the machine.

The grinding wheel head is of massive design and is equipped with an alloy steel spindle, hardened and ground. This spindle is mounted in bronze cap bearings which are lubricated under pressure. A 30-in. diameter grinding wheel is used.

Hydraulic rapid power infeed to the grinding wheel head is furnished. The wheel moves toward the work at high speed until it starts to grind when it automatically slows down to the predetermined grinding feed and continues to move in at this slow feed until it comes against a positive sizing stop. Movement of the wheel away from the work is also rapid. Several convenient levers control the direction and speed of the feed, and hand feed, similar to that used on previous Landis grinders, is also provided. Power for the hydraulic wheel feed is furnished by a geared pump driven from the rear drive shaft, a portion of the base of the machine being used as a container for the oil. The work carriage is traversed by hand, a back gear arrangement giving a slow speed for truing the grinding wheel.

The machine may be arranged for either line shaft or direct motor drive.

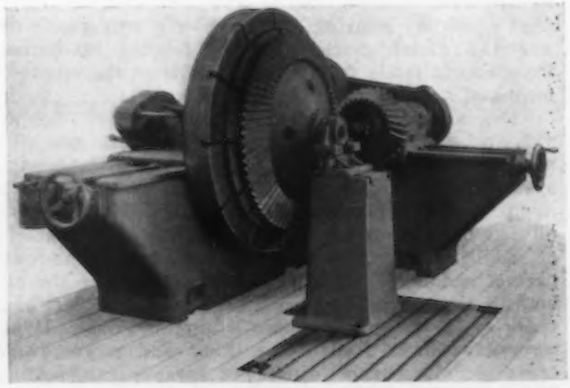
Large Bevel Gears Tested for Quietness and Proper Tooth Bearing

Equipment for testing bevel gears up to 90-in. in diameter for quietness and proper tooth bearings has been made available by the Gleason Works, Rochester.

The arrangement of the machine may be noted from the illustration. The frame is cast in two pieces, bolted, and rigidly reinforced. The spindle heads are mounted on slides with a long narrow guide giving unusually close alinement. Rectangular taper gibs serve to take up any wear on the ways, which are guarded to protect them from red lead, dust, etc. Each head may be adjusted horizontally by a hand wheel which is graduated to 0.001 in. and operates through a lead screw. The head is secured in place by two clamps, one at each end. The spindles, which are accurately mounted on the same plane and intersect at 90 deg. are fitted with ball bearings. An oil pocket at each end of the spindle heads is provided with a sight glass to enable the operator to see that the bearings are properly lubricated.

The machine is driven by a 10-hp. motor, mounted on the drive head, and the spindles may be revolved in either direction. A friction brake on the driven spindle permits the testing of gears under load. The arbors are held in place by draw rods, which are tightened from the rear of the spindles, and a lock is provided for holding the spindle when the work or arbor is to be removed. A steadyrest, furnished with the machine as an outboard support for heavy gears, can be adjusted to take care of any size gear within the capacity of the machine.

The distance from the nose of the drive-head to the center line of brake-head is, minimum with faceplate 20 in.; minimum without faceplate 6⅜ in.; the maximum distance is 57 in. The distance from the nose of the brake head to the center line of drive head is, minimum, 3½ in. and maximum, 44 in.



A Friction Brake on the Driven Spindle Permits the Testing of Gears Under Load

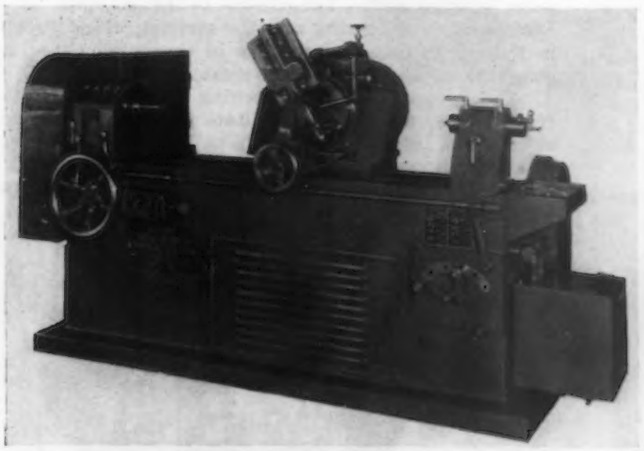
Gear Hobber and Thread Miller for Spline Shafts and Other Work

For the hobbing of spline shafts and the hobbing or milling of screws and worms, the Adams Co., Dubuque, Iowa, is offering the No. 5 gear hobber and thread miller here illustrated. The machine is also adapted for the production of small spur and helical gears. It will accommodate work up to 10 in. in diameter and 48 in. between centers and will take 3-in. diameter bars through the hollow spindle. A special headstock for 5-in. bar work can be furnished.

The base of the machine is one piece and of heavy box construction, and incorporates a trough for the collection of chips, the coolant passing into a reservoir.

The driving motor is contained within the base and is controlled by a reversing switch and push-button station. The motor is conveniently accessible from the front door. The drive includes a multiple-disk clutch, submerged in oil, and Link-Belt silent chain from the motor to the speed gear box.

Sliding gear transmission provides eight cutter spindle speeds from 70 to 350 r.p.m. Pick-off gears



Although Primarily for Hobbing Spline Shafts and Hobbing or Milling Screws and Worms, the Machine May Be Employed for Small Spur and Helical Gears

are provided for 39 standard feeds, the gears being housed in a built-in rack in the end of the machine. Special feeds, for worms and screws having special leads, may be calculated conveniently.

The balanced head drive employed is said to impart vibrationless power to the cutter spindle. This drive is mounted on double-row New Departure ball bearings, and the location of the head permits the chips to drop free. Ample flow of coolant is available for cutting steel. The vernier setting of the head to any required angle is controlled by a handwheel. The handwheel at the front of the cross-slide controls a micrometer setting for depth of cut.

Centralized control is a feature. Located near the headstock are the push-button station for starting the motor, the clutch lever for starting the machine, and the lever for engaging the feed, as well as the handwheel for operating the lead screw. Lubrication has been given thorough attention. The head mechanism operates in grease, which is inserted by means of a large cup in the rear. All other bearings and gears are lubricated by the Madison-Kipp fresh oil system. Heat-treated alloy steel gears are used throughout, with the exception of pick-off feed gears.

When cutting splines or threads in the end of long shafts, the shaft is held in a chuck with hardened jaws, which replaces the headstock center. A follow rest on the cross-slide rigidly supports the shaft in back of the cut.

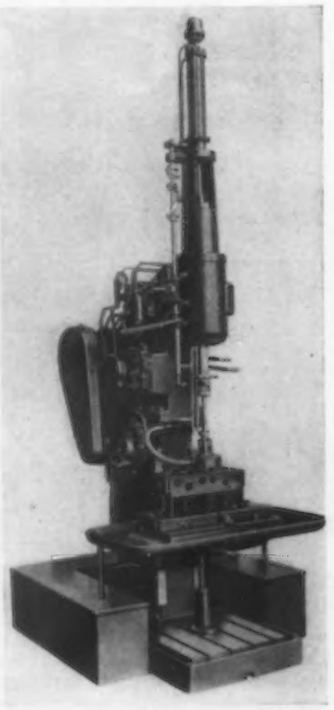
A new pen attachment for use with its universal divider No. 843, and steel beam trammels No. 845, with 14 in. beam, has been announced by the Brown & Sharpe Mfg. Co., Providence. The pen attached is tapped to receive the knurled handle from a tram. The device is intended to facilitate the accurate drawing of circles, arcs, fillets, etc.

Honing Machine With Hydraulically Reciprocated Spindle

The Barnes Drill Co., Rockford, Ill., has brought out a single-spindle honing machine, designated as the No. 249, the important feature of which is the reciprocating spindle, hydraulically controlled as to length of stroke. The table does not reciprocate, but an air operated table can be furnished for cases when the 16 in. of vertical spindle travel is not sufficient to permit of lifting the hone out of the work. The air cylinder allows the table to be lowered about 9 in.

An Oilgear pump and special valve control is used for the automatic spindle reciprocation. The cycle of reciprocation may be changed while the unit is in operation by means of a volume regulator control. The special automatic valve employed is said to absorb and soften the thrust at each end of the stroke. The length of the stroke may be set for just the right amount of over-run of hone at each end of the cylinder, a feature stressed as preventing bell mouth and removing taper.

Four speeds are recommended, but eight quick-change speeds or only one speed can be furnished. Ball bearings are used throughout the machine.



An Oilgear Pump with Special Valve Control Is Employed for Reciprocation of the Spindle. The cycle of spindle reciprocation may be changed while the unit is in operation

The six-splined spindle operates in a broached cast-iron hub with a steel bevel crown gear. The hydraulic cylinder is superimposed directly over the spindle and the piston is attached to the spindle by means of a ball bearing coupling. This permits of any spindle stroke desired and assists in setting the spindle stroke so that the hones will extend an equal distance through the bore at each end of the stroke. Stops on a vertical rod may be adjusted for any length of stroke within the maximum of 16 in. Rotation and reciprocation are started simultaneously by a clutch lever on the left-hand side of the head. A latch on the lever permits of hand control of vertical spindle travel without engaging the clutch.

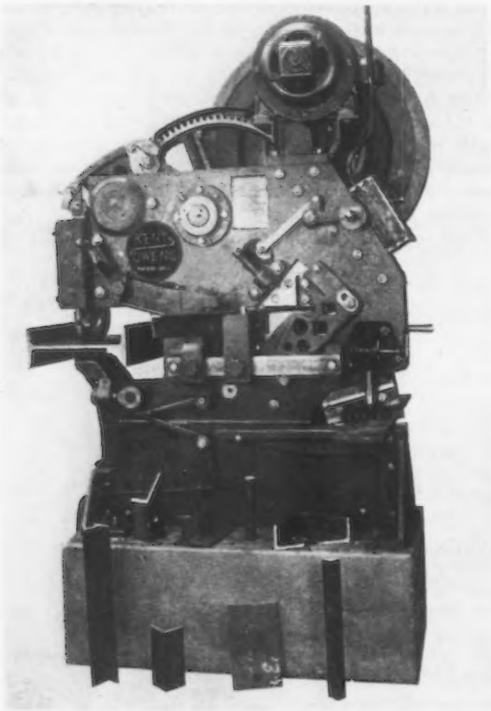
The machine is driven by silent chain from a flanged motor mounted inside of the column. A 5-hp. motor is recommended for honing cylinders up to 4 in. in diameter and a 7½-hp. motor for larger cylinders. The Oilgear pump may be adjusted to give 40 to 50 strokes per min.

The distance from the center of the spindle to the face of the column is 12 in. and the maximum distance from the top of the table to the nose of the spindle, No. 4 Morse taper, is 50 in. maximum and 10 13/16 in. minimum. The working surface of the table is 18 x 28 in. The floor space occupied by the machine is 31⅝ x 55⅝ in. and the height is 11 ft. 9 in. overall.

Combination Machine for Punching, Shearing and Other Operations

To meet the needs of shops having a variety of work, the Kent-Owens Machine Co., Toledo, Ohio, has built the machine illustrated, which is designated as the all-purpose iron and steel worker.

The various tools provide for punching, cutting and mitering of sections; shearing of round and square bar stock; and shearing flats and plates. An attachment also provides for coping and notching. The



One Operator May Be Punching While a Second Is Either Cutting Sections, Bar Stock or Shearing Plates

punch may be operated independently of any of the other tools, the arrangement being such that one operator may be punching holes while a second is either cutting sections, bar stock or shearing plates.

A feature of construction is the welded frame, the side members of which are of steel and are electrically welded to intermediate forgings. It is claimed that this welded steel frame not only provides the strength inherent in steel construction but is also rigid and is free from slipping or weaving of side members.

The punch is full floating, with adjustable stroke. It may be brought to the surface of the work by means of a hand lever, or the stroke may be set so that it will always come to rest immediately above the work. This feature is pointed out as a convenience either when punching material of varying thickness or when punching a large number of holes in material of uniform thickness. The punch and die blocks are designed to provide large clearance for punching holes in the web and flanges of I-beams, H-sections, channels and other sections without having to change tools. An adjustable gage is furnished for cutting-off sections either square or at any desired angle. The bar cutter has an adjustable hold-down plate, all of the openings in which are visible.

Interchangeable upper and lower steel knives, having four cutting edges each, are used in the shear. The welded construction is claimed to permit unusually large clearance in the shear ways. These ways are free from any obstructions. All bearings are phosphor bronze lined. Lubrication is by high-pressure Alemite grease system. All slides are counterbalanced.

The capacity of the punch is for 1-in. holes in ½-in. plate. Angles up to 4 x 4 x ⅜ in. may be cut off square, and up to 3 x 3 x ¼ in. mitered at a 45 deg. angle. Rounds up to 1⅝ in. and squares up to 1½ in. may be cut off in the bar cutter. The shear takes flats and plates up to ½-in. in thickness.

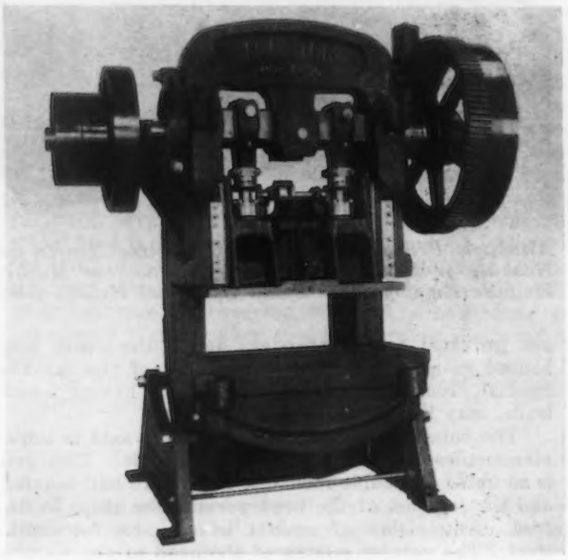
Either motor drive with 3-hp. motor arranged, as illustrated, or belt drive, may be furnished. Steel cut gears are used in the driving mechanism. A simple positive-type clutch is employed. The machine may be mounted either upon a concrete foundation as shown or upon a structural steel box section. The weight of the machine is approximately 3300 lb.

Double-Crank Open-Back Inclinable Press for Variety of Production Work

A double-crank open-back inclinable press in three sizes, having ram pressure of 32, 45 and 56 tons, respectively, has been brought out by the Minster Machine Co., Minster, Ohio. Rigid construction is a feature stressed, as well as the adaptability of this type of machine to a variety of production work. The weight of the smallest machine is 5300 lb. and of the largest, 13,000 lb.

The presses are equipped with a jaw or block clutch, the flywheel type machine being furnished with two-point engagement and the geared type with three-point engagement. The clutch collar is made of a hammered steel forging and the striking block inserts, in the clutch collar as well as in the clutch wheel or gear, are of alloy steel, heat-treated and hardened.

A deep gap and wide opening is provided in the frame of the machine to facilitate the feeding of work either from left to right, or front to back. The press is also equipped with an inclining adjustment, which permits the frame to be raised or lowered by means



An Inclining Adjustment Permits the Frame to Be Raised or Lowered. Presses with ram pressure of 32, 45 and 56 tons, respectively, are available

of two telescoping screws connected by bevel gears. The supporting trunnions on the frame are located so that when the press is inclined, the height from the floor to the center of the die does not change materially.

Frame castings are of semi-steel. The frame is carefully proportioned, and is reinforced at points under greatest strain. Tie rod lugs are cast on the frame so that steel tie rods may be used to increase the rigidity of this member, if the nature of the work demands it. The crankshaft is made of high-carbon hammered steel forging. Main bearings are wide and well supported, and the pin bearings are proportioned to take the heavy pressure exerted on this member.

The slide is of flanged slide type, is well ribbed and unusually heavy. The ways are long and accurately machined. The slide is supported in long and heavy gibs, which is stressed as permitting this member to operate with the minimum of wear and adjustment. Adjustment of the slide is provided for through two sets of bevel gears and pinions, operated through ratchet arrangement.

HIGH FRAME HAMMERS

Self-Draining Cylinders Among the Features of Single-Frame Machines

INCREASE in capacity, as well as in general efficiency, and the incorporation of safety features, are emphasized in connection with new high-frame hammers of the Chambersburg Engineering Co., Chambersburg, Pa. Three types, guided ram, guided rod and tool dressing hammers, are available.

The guided ram single-frame machine is designed to permit the forging of large disks and rings, upsetting of high stems and the forming of arch bars on

A Patented Safety Cylinder Cover and Safety Valve Have Been Incorporated

economical sizes of tools. Increased working space is also said to facilitate long punching with drifts.

The cylinder is self draining, has deep stuffing boxes, and is held to the frame by body bound bolts. The steam joint between the intake stuffing box and the cylinder has been eliminated. A patented safety cylinder cover and safety valve are features, the cylinder cover being intended to provide a cushion of live steam or air at the top of the cylinder not subject to the pumping of the hammer. In limiting the stroke it protects the cylinder and obviates the hazard of broken cylinder covers in the event of rod breakage or loosening. It reseats itself immediately on functioning. The safety valve, under the operating valve, serves to shut off the steam or air in case of damage to the valve gear. Cylinder gaskets are protected. The throttle valve is of rotary self-seating type, ground in place, and the operating valve is ground into a removable cage. A through stem with fixed nut preserves alinement; it is actuated by cam on the ram incline, without fixed connection.

The frame, of semi steel, is of heavy reinforced box section. Front tie bars are provided on sizes under 3000 lb. falling weight, and front and rear tie bars on larger sizes. The frame is solid with the base plate on sizes under 5000 lb. falling weight, the frame being bolted to the baseplate on larger sizes. Guides are also of semi steel, and are of inserted type, supported on five sides by the frame. The guide adjusting wedges are of steel and have bearings the full length and width of the guides. The guides and shoes may be adjusted without disturbing the ram. These parts are said to have been strengthened to practically confine breakages to the adjusting bolt. The latter may be replaced conveniently by raising the shoe through the hole provided until the adjusting bolt will slip out. A single guide clamp is used on the smallest size, 700 lb., hammer.

The ram is an annealed steel forging set at an angle to the frame and the rod, also an annealed steel forging, is solid with the piston. Piston rings are of steel and of narrow type. Rings may be examined and renewed without removing the rod from the ram.

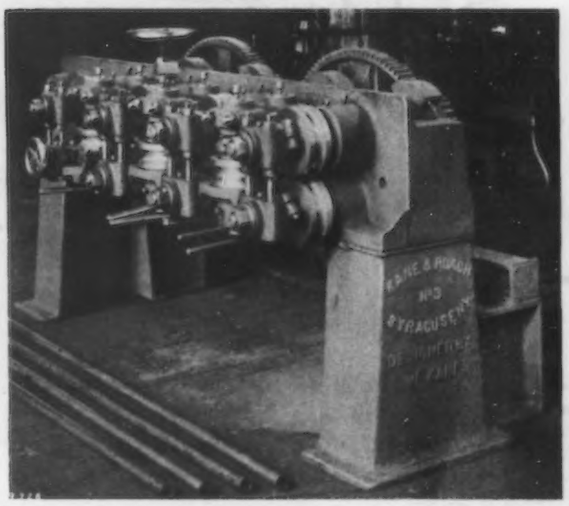
The guided rod hammers (not illustrated) embody the features of the guided ram machine and are adapted for work requiring unusually high clearance. The tool dressing hammers are offered for general light blacksmithing and small drop forge work as well as for tool dressing. Cylinder and valve characteristics are the same as in the guided ram machines and the valves are arranged for both hand and pedal control. The frame is a semi-steel casting of I-beam section and is cast integral with the anvil. The guides of sizes under 400 lb. are bolted on instead of inserted. Eight sizes, ranging from 50 to 500 lb. are available.

Tube Sizing and Straightening Rolls

Kane & Roach, Inc., Syracuse, N. Y., have placed on the market a new tube sizing and straightening roll which is available in a number of sizes.

In this machine the horizontal roll shafts are gear driven and the vertical roll shafts are idlers. The upper horizontal roll shafts are mounted in an eccentric bearing to provide for adjustment in case one run of the stock from the mill varies from another, or should it be necessary to regrind the rolls. In addition, the last pair of vertical roll shaft sizing rolls are adjustable up and down, as well as in and out, which is stressed permitting the rolls to have a straightening effect on the tubing.

All roll shafts are rigidly tied together with outer bearings, as shown in the illustration. Drive gears are of steel forgings and have cut teeth, and the roll shafts



Finished Tubing Is Delivered at Rate of 75 Ft. per Min.

are ground to size. Bushings are press fitted into the frame, after which they are reamed to assure a true and tight running shaft. Rolls are of tool steel, heat-treated, and are ground to size. The diameter of each set of rolls is graduated so that as the material passes through, each succeeding set reduces this material until the finished size is reached.

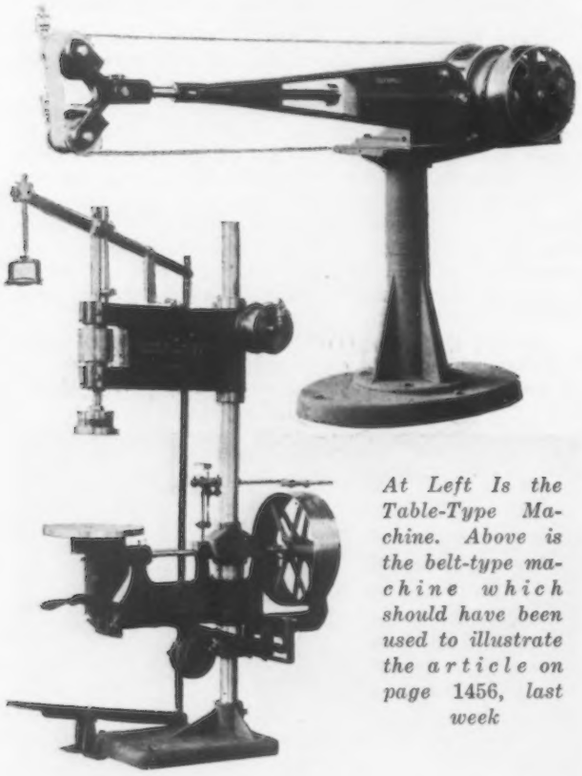
The material shown in the foreground of the machine illustrated is 1¾-in. welded tubing, which as received varies from 0.010 to 0.030 in. oversize. This tubing is put through the sizing rolls and delivered with a tolerance of plus or minus 0.002 in. It is claimed that in factory tests this material was finished to an average tolerance of plus or minus 0.001 in. The unit is arranged for direct-connected motor drive and delivers the tubing at the rate of 75 ft. per min.

Tumbling barrels to the number of 92, six cupolas and a quantity of ladles were supplied the foundry at Flint, Mich., of the Buick Motor Co. by the Whiting Corporation, Harvey, Ill., mention of which fact was omitted in the article in the issue of Nov. 17, describing the automatic charging of the cupolas.

Table-Type Polishing Machine

A vertical revolving table grinding and polishing machine designed for grinding or polishing flat surfaces in wood and metal has been brought out by the Defiance Machine Works, Defiance, Ohio. Among uses for which the machine is adapted are grinding and polishing the center of steering wheel spiders and seats for automobile wheel flanges. It can be used also for a wood-boring machine, for such work as boring out center holes in automobile wheels and drill flange bolt holes.

The revolving table has a planed top 15 in. in diameter and is mounted on a swinging arm which can be adjusted off center. It is power driven with a speed to suit requirements. The spindle, made of hammered steel, is 1½ in. in diameter and travels through a splined sleeve with an 8-in. vertical movement. The maximum distance from the nose of the spindle to the top of the table is 14 in. A distance of 20 in. can be obtained by dropping the table to the base. The distance from the center of the spindle to the face of the column is 22 in.



At Left Is the Table-Type Machine. Above is the belt-type machine which should have been used to illustrate the article on page 1456, last week

The spindle can be fitted with disks up to 10 in. in diameter, the faces to be covered with polishing material, or with an expanding chuck as shown in the photograph. To this chuck is clamped a cup grinding wheel 4 in. in diameter, with ¾-in. ring face and a 2½-in. hole. The spindle can be fitted also with a universal chuck to carry boring bits with ½-in. or smaller shanks. The speed of the vertical spindle is 2500 r.p.m. It can be lowered either by hand or by foot treadle. The machine is driven by a 3-hp. motor.

The machine is regularly furnished with a separate countershaft, complete with belt shifting apparatus, with attached tight and loose pulleys for feed to the revolving table, with a polishing disk or a grinding head as shown in the photograph, or with a universal chuck. The countershaft, 1 11/16 in. in diameter, has two adjustable drop hangers fitted with Hyatt roller bearings, one driving pulley 21 in. in diameter by 4-in. face for the boring spindle, one feed pulley 2½ in. in diameter by 5½ in. straight face, and one pair of tight and loose pulleys 10 in. in diameter by 5-in. face, with a speed of 600 r.p.m. The belt shifting apparatus is of the rack and pinion type.

Brazil absorbs nearly half of all the hand tools imported by the score of Latin American republics, taking nearly half her supply from England.

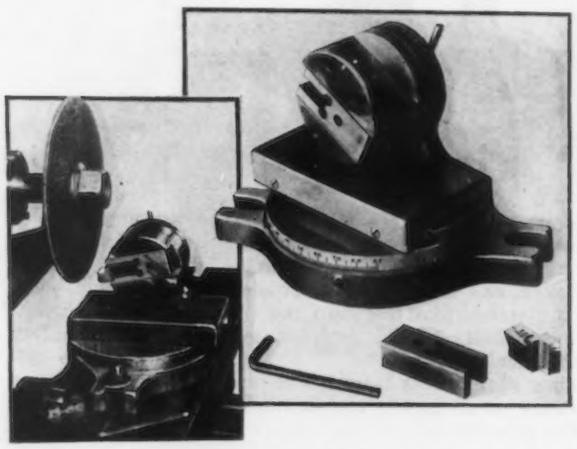
Namco Chaser Grinding Fixture

The National Acme Co., Cleveland, is bringing out the fixture illustrated which is intended for the uniform grinding of chasers used in the company's Namco thread-cutting tools. Simplicity of operation of the device is said to adapt it for use on any grinding equipment fitted with a table, and carefully graduated adjustments permit of uniform and accurate chaser grinding.

A set of five adaptors is furnished with each fixture to take care of the entire range of chasers used in Namco self-opening die-heads. Changing of these adaptors in the adjustable holder is simple. Two hollow set screws hold both the adaptor and the chaser firmly in place during the grinding operation, and by loosening these two screws the operator can readily remove both the adaptor and the chaser.

The fixture is arranged for convenient fastening to the table of the grinding machine. The indexing plate, which is adjustable for swing to an angle of 90 deg. in each direction, allows for a maximum of adjustment. The holder for the adaptors is also adjustable and is graduated for the various angles that might be required for the grinding of the chaser throat or chamfer. An advantage claimed for the fixture is that both the chaser face and the throat are ground with the use of only one wheel, which, in addition to saving by reduction of wheels carried for the different throat grinds in production work, saves the time of changing grinding wheels.

Charts furnished with each fixture provide the following information: Proper angle for grinding of chaser face and throat or chamfer as required for various materials to be threaded; correct cutting speeds; and also the proper lubricant. Information as to the use of different wheels for various chaser sizes is also listed.



The Chaser Grinding Fixture Permits Both Face and Throat of the Chaser to Be Ground with the One Wheel

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Meeting of American Institute of Weights and Measures

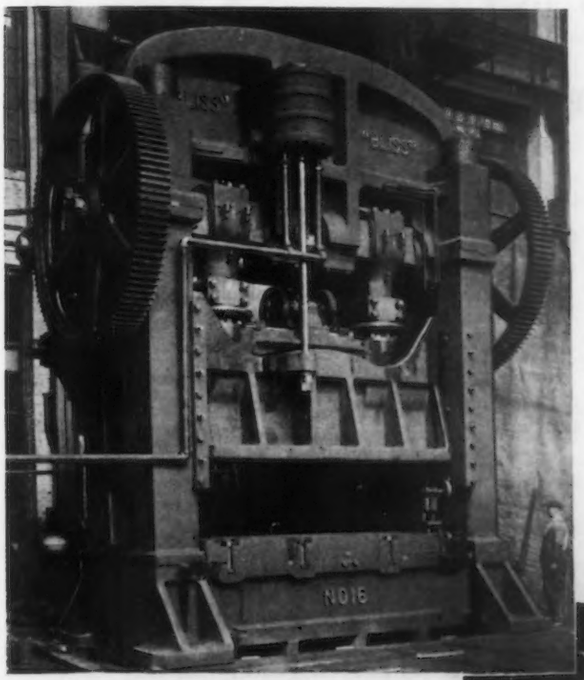
The American Institute of Weights and Measures will hold its annual meeting in the institute rooms at 115 Broadway, New York, on Thursday afternoon, Dec. 8, at 2.30 p. m. Routine administration business will be conducted, and the technical business will include a discussion of procedure to secure a unanimous recommendation from United States industry of a new and more convenient name for the unit of measurement, the thousandth of an inch. Other subjects to be discussed will be the procedure to secure a unanimous recommendation for small units of volume and weight of the order of magnitude of the cubic centimeter and the gram, respectively, which will not have the disadvantages of the metric unit. W. E. Bullock is secretary of the institute.

LARGE DOUBLE-CRANK PRESS

Complete Machine Weighs More Than 300 Tons —Crankshaft Is 16-19 In. in Diameter

OF interest not only because of its unusual size, but also, perhaps, as an example of the application of equipment of its class to the production of heavy pieces usually manufactured by other processes, is the large double-crank press here reproduced, which was built recently by the E. W. Bliss Co., Brooklyn, N. Y.

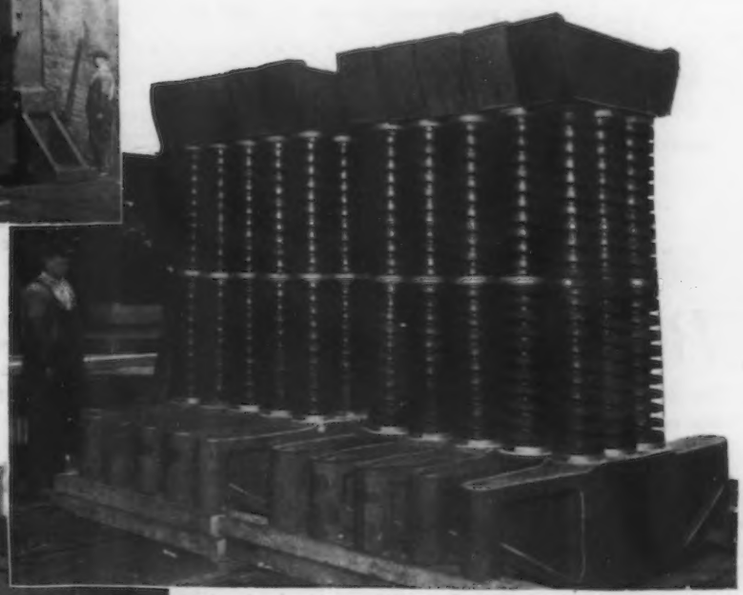
This press, the largest of its type that has been built by the Bliss company, weighs more than 600,000 lb. and is equipped with a crankshaft which measures 16 in. in diameter at the bearings and 19 in. in diameter at the pins. It is of tie rod construction, the entire working strain being taken by the four large steel tie rods that tie the bed, crown and uprights together. The uprights serve to carry the weight of the shaft, gearing, crown and slide. The bed is of cambered construction and weighs 60 tons; it is the largest casting ever made in the Bliss company's foundry. Neither the arch section, which comes below the floor line, nor the spring pressure drawing attachment, which fits into the lower portion of the bed, is visible in the illustration of the assembled machine, but some idea of the proportions of the bed may be had from the separate illustration showing the bed being machined on a planer having a distance of 14 ft. between the housings. The spring pressure attachment, which has a capacity of 350 tons, is also shown separately, assembled on the floor prior to being put into the bed.



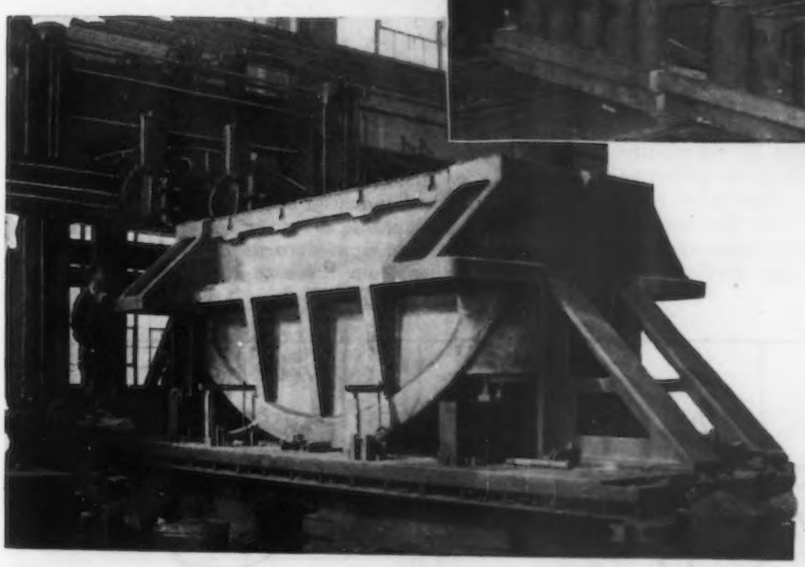
Working Strain Is Taken by Four Tie Rods That Tie the Bed, Crown and Uprights Together. The bed weighs 60 tons, the crown 58 tons and the slide 34 tons

Slide Adjusted by 15-Hp. Motor

The crown of the press weighs 58 tons and the slide weighs 34 tons. The latter is counterbalanced by two air cylinders attached to the crown, one being at the front of the machine and the other at the rear. Adjustment of the slide is made by a 15-hp. motor. The machine is twin driven and ratio of gearing is 50 to 1. Some of the general dimensions of the press are as follows: Stroke of slide, 15 in.; distance between uprights, 160 in.; area of slide face, 60 x 148 in.; area of bed, 60 x 160 in.; area of opening in bed, 48 x 148 in.; and area top of bolster, 60 x 158 in.



The Spring Pressure Pad Has Capacity of 350 Tons. The illustration shows this unit as assembled prior to putting in the press



The Bed, of Cambered Construction, Is Shown at Left Mounted on the Table of a Planer

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A cargo boat equipped with a large 2-ton disk attached to a crane will be used to recover pig iron in the Newcastle steamer Ellerwater which was wrecked off the coast of North Berwick, England, last week. The crane boat will be brought alongside the wreck and the iron will be removed by means of the magnetized disk attached to the crane.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

GENERAL BUSINESS OUTLOOK

Favorable Factors

1. The P-V line rises; general adjustment between demand and supply becomes more favorable.
2. The main trend of commodity prices is upward.
3. Building contracts increased in October; increased bookings of structural steel.
4. Unfilled steel orders increased last month.
5. Farm purchasing power is fair to good.
6. Continued easy money.
7. The stock market recovered the ground lost in October.
8. Caution prevails, and curtailment where required.
9. Decrease in manufacturers' physical inventories.
10. Prospects of tax reduction.

Unfavorable Factors

1. Decline in factory employment and payrolls.
2. A further setback in retail trade.
3. Further decline in automobile production and in residential building.
4. Slump in the textile industries.
5. Railroad freight traffic and earnings fail to make the usual seasonal gain in October.
6. The fundamentals of the banking situation are not so strong; brokers' loans high, gold exports, Federal Reserve ratio below a year ago.
7. Difficulties attending German reparations payments begin to loom up.
8. New England flood damage.
9. Political uncertainties; prospects of disturbing investigations (utility holding companies, etc.); railroad mergers doubtful.

RELATIONS of the favorable and unfavorable factors indicate a mixed condition during the near future. The favorable factors, however, are the more fundamental as bearing on the more distant future. Some recession is still in evidence, but the process of stabilization is well under way, as is usual near the bottom of a business cycle. Clear indications exist which show that improvement should appear before the end of the year.

Demand Is Overtaking Supply of Goods

THE P-V line is now in a position similar to that at the end of 1923. The September final P-V index is 99.7 and the October preliminary index is 100.1. This barometer has had an upward movement for six months and is well across its normal level, which is estimated to be about 95. This means that the supply of commodities has been so curtailed, and that the demand for commodities has been so well sustained, that on the average the commodity markets are developing a stronger position—that buying is likely to increase, prices to rise and production to expand. The improvement may not last long, as was the case in early 1924, but the action of this reliable barometer indicates a period of better business lasting at least through March, 1928.

Being so closely related to general business conditions, the steel industry has on the whole been forecast with considerable accuracy by the P-V line. The barometer has anticipated turns in steel production by periods ranging from three to eight months. We see

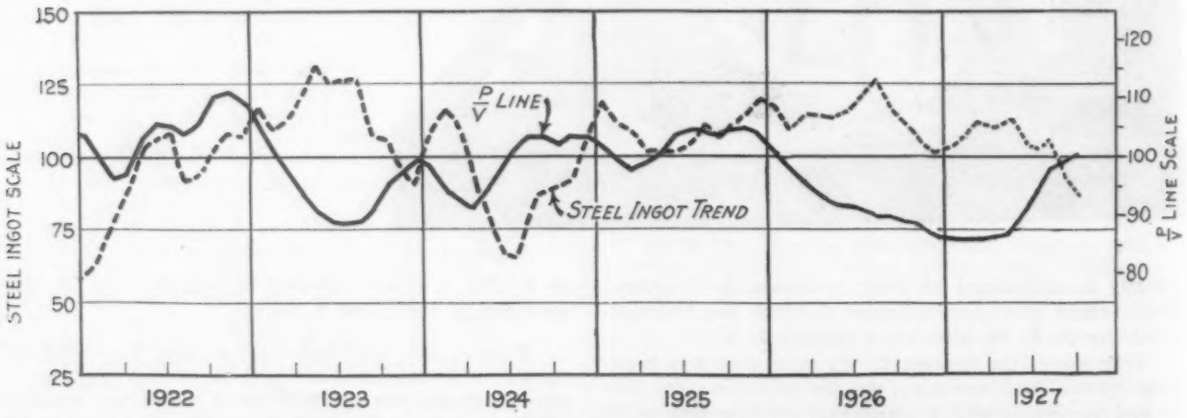


Fig. 1—Upward Movement of the P-V Line (Representing the Ratio of Commodity Prices to the Physical Volume of Trade) Continues Well Above Its Estimated Normal. This presages improvement in business and forecasts both better buying and firmer prices. Ingot production should show a healthy increase within two months

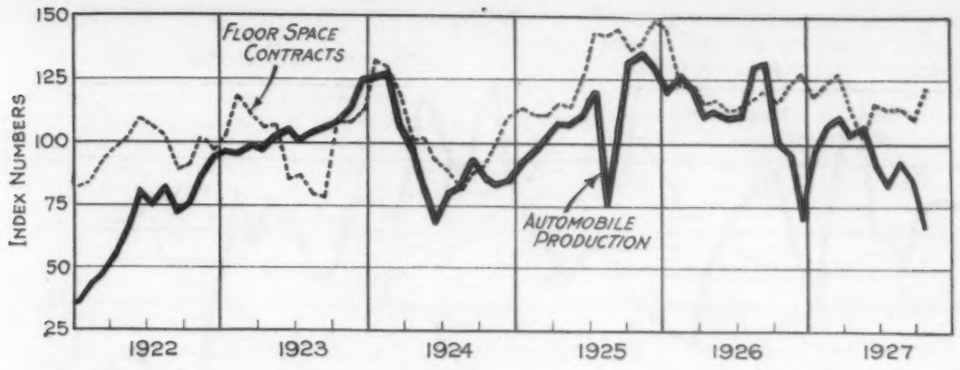


Fig. 2 — Potential Demand for Steel from Construction Activity Has Been Well Sustained. Reduction in the automobile demand is thought to have about reached bottom

no reason why the usual relation should not prevail at present and, therefore, expect steel production to show an increase of more than seasonal proportions within the next two months. This expectation is strengthened by the fact that production is now well below normal.

It would be in line with the average performance if the bottom of the steel ingot output were reached in November and an expansion were to begin in December, but it is not pretended that the turn can be anticipated with such exactness as to make this certain. October may turn out to have been the low point in production, or it may be postponed until December. (It is to be remembered that the steel production curve is adjusted to eliminate seasonal variations and the factor of long-time growth.) Much will depend on the development of the automobile industry, which for months has been under the influence of an abnormal situation.

Building Demand Continues Heavy

CONSTRUCTION activity is one of the relatively bright spots in the steel situation (see Fig. 2). Bookings of structural steel have been well sustained, and increased in October. This reflects a good sized gain in the volume of new contracts awarded, which carried our adjusted curve somewhat above normal and to the highest point reached since last March.

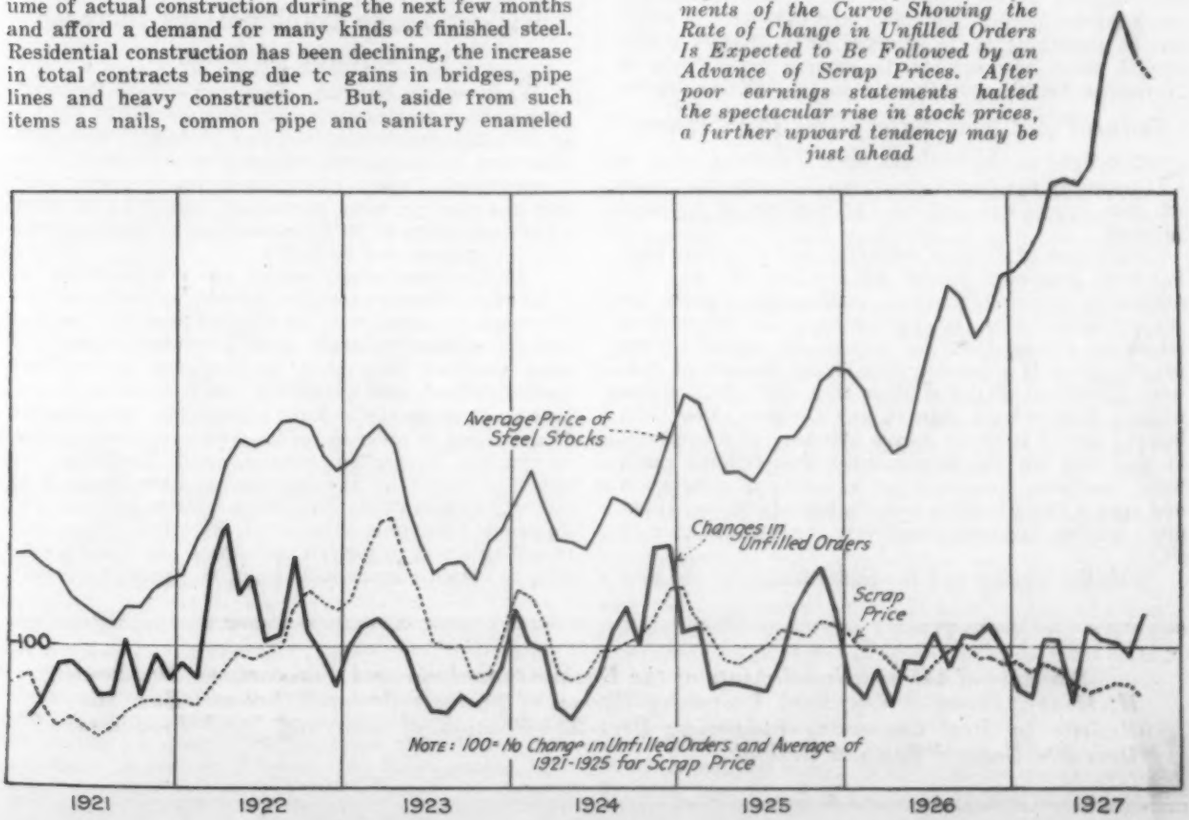
Measured in square feet of floor space, the new contracts in October were considerably above the level of a year ago. This would seem to insure a large volume of actual construction during the next few months and afford a demand for many kinds of finished steel. Residential construction has been declining, the increase in total contracts being due tc gains in bridges, pipe lines and heavy construction. But, aside from such items as nails, common pipe and sanitary enameled ware, the heavy construction referred to is the more important as to steel requirements.

Aside from occasional large construction projects (which are likely to continue as long as building materials are low in price and money is easy), however, it is doubtful if the general building prospects for early 1928 may be classed as good. Certain indications suggest the contrary. According to the figures of the F. W. Dodge Corporation, the broad trend of contemplated new construction has been downward since April, and in October became relatively low in comparison with new contracts. Building permits have fallen to the lowest point since July, 1924. The recent decline in the volume of new business enterprises is another indication. Taken together, these indications make it probable that building activity will show some further decline in the early part of next year.

Automobile Activity Nearly at Bottom

As to the automobile industry, both production and sales seem to have fallen for about as long a time as they are likely to do so. In October some 229,000 cars and trucks were produced, which is the lowest monthly total since the middle of 1922. Plainly a cyclical downswing has occurred in this industry. Such movements by their very nature terminate, and end in recoveries, at more or less regular intervals. We agree with those who think that, with the termination of the uncertainty caused by the Ford situation, the automobile business

Fig. 3 — Recent Upward Movements of the Curve Showing the Rate of Change in Unfilled Orders Is Expected to Be Followed by an Advance of Scrap Prices. After poor earnings statements halted the spectacular rise in stock prices, a further upward tendency may be just ahead



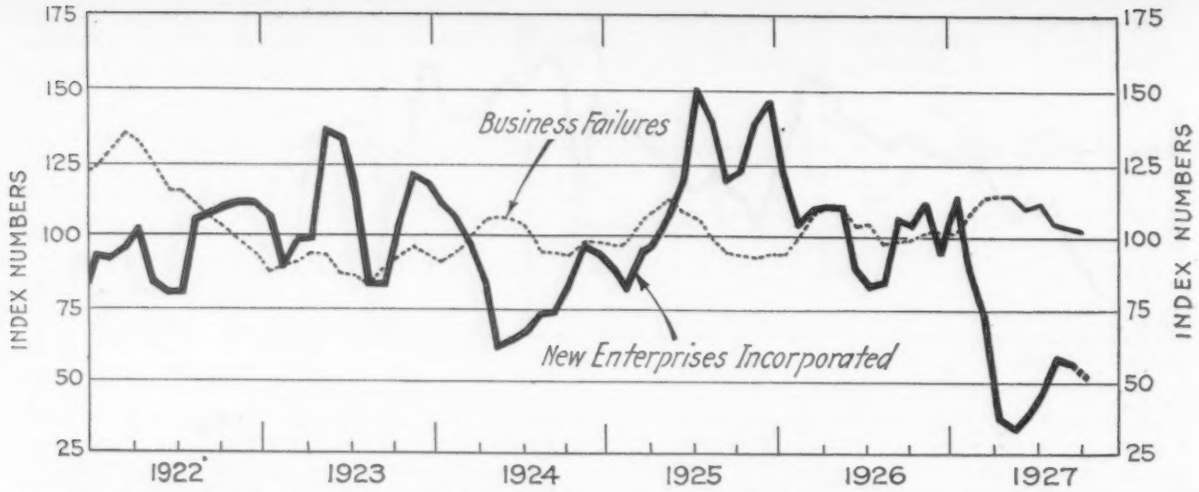


Fig. 4—Business Failures Have Been Trending Downward. New business enterprises have declined sharply from a former high level and may indicate the bottom of the business cycle. Both curves are plotted as three-month moving averages, to avoid excessive local irregularities

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SOME light on the business birth and death rates is thrown by the fourth chart, which shows the trends of new enterprises and of the number of business failures.

The trend of failures, contrary to a common idea, has been downward during the last few months. The maximum number of business failures, considering the season, occurred in the April-June period, when they numbered around 1900 per month. In October, when usually there is a considerably larger number of failures, the actual statistics show only 1787. This represents a higher level than in any October since 1922, but the excess is by no means alarming in magnitude. In any case one should remember that failures reach their maximum number *after* a period of depression and that a large number usually attends the readjustment leading to business recovery, as was the case in 1922.

Both the number and the capitalization of the new business enterprises which were incorporated in October fell to very low levels (Fig. 4). In number, they were the lowest since 1924; in capitalization, since 1921. Here, again, we see indications of the low point in a business cycle—another sign that business has fallen into the trough of a recession and that any important change is now likely to be in the direction of recovery.

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Small Company Plays Conspicuous Part in Manufacturing

Despite the conspicuous part played by large-scale enterprise in American economic life, the bulk of business of all kinds is still being carried on by relatively small concerns. Even in manufacturing, where large scale production is the dominant factor as measured by output and number of employees, the moderate sized plant remains the typical unit, according to the National Industrial Conference Board, 247 Park Avenue, New York.

While the growth of large scale business has been most notable in manufacturing, nearly three-fourths of all manufacturing plants in 1923 employed only 20 wage earners or less each, and about two-thirds of all plants produced goods not exceeding $100,000 in value each during the year. The dominant part played by large scale production, however, can be appraised by the fact that, on basis of 1925 data, it takes only about one-third in number of all manufacturing plants to turn out nine-tenths, in value, of all products, and that this one-third of all plants employs nearly nine-tenths of all wage earners in the industry. While thus a factory employing 1000 wage earners may be more important than 100 employing 10 workers each, significance is attached by the Conference Board to the fact that the large and the small concerns can and do exist side by side and in a highly competitive market.

Ore Shipments This Year Nearly 13 Per Cent Under 1926—November Small

CLEVELAND, Nov. 29.—Iron ore shipments by water from the Lake Superior district this year were 51,107,136 gross tons, a decrease of 7,430,719 tons, or 12.64 per cent, from last year, when the movement by water was 58,537,855 tons. In 1924, which was a light year, shipments amounted to only 42,623,840 tons. In 1925 the movement was somewhat larger than this year. The record year was 1916, when the water movement was 64,734,198 tons. All rail shipments will probably be somewhat less than 1,500,000, making the total movement for the year about 52,500,000 tons.

The shipping season closed Sunday with the dispatch of the last cargo from Superior. It was the earliest closing of the shipping season for several years. Usually a few cargoes are shipped in December. The November movement was 2,000,422 tons. Consumers took about all the ore called for by their early season schedules in spite of the slowing down in the iron and steel industry, but there was very little late season buying. Shipments by ports for November, for this and the previous year, and total shipments for ten years are listed below.

Lake Ore Shipments by Water, Gross Tons

	November Shipments	Season, 1927	Season, 1926
Escanaba	422,020	5,865,224	6,599,597
Marquette	189,749	3,238,855	3,417,462
Ashland	217,722	6,239,774	7,139,865
Superior	703,948	14,627,936	16,476,264
Duluth	301,702	15,432,188	18,638,395
Two Harbors	165,281	5,703,159	6,266,272
Total	2,000,422	51,107,136	58,537,855
1927 decrease		7,430,719	

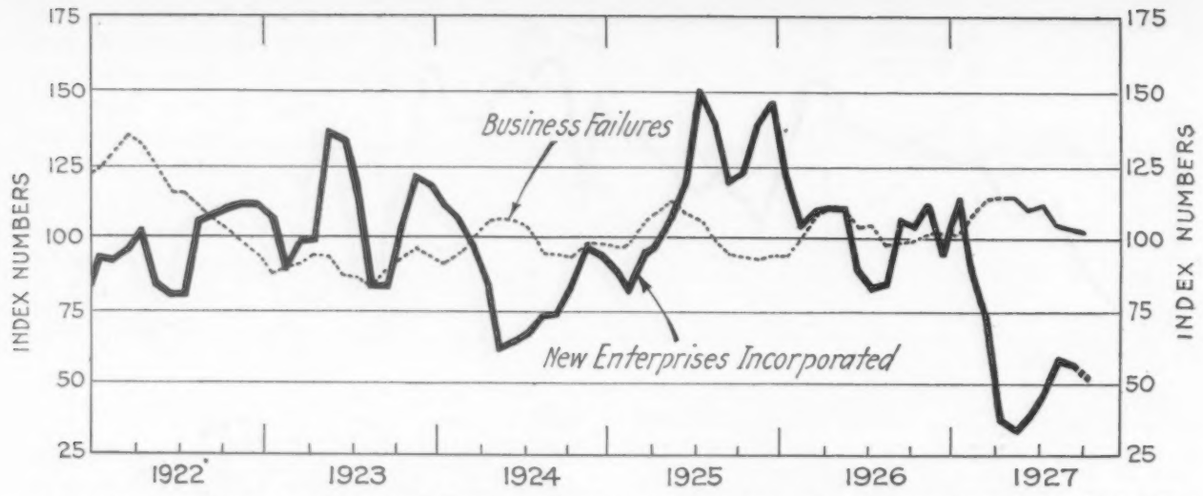
Water Shipments of Last Ten Years, Gross Tons

1918	61,156,732	1923	59,026,092
1919	47,177,395	1924	42,623,840
1920	58,527,226	1925	54,098,492
1921	22,300,726	1926	58,537,855
1922	42,622,248	1927	51,107,136

To Make Sponge Iron in New Brunswick Mines

TORONTO, ONT., Nov. 29.—The Canadian Iron Foundries, Ltd., and other interests are contemplating mining operations on an extensive scale in the iron mines near Bathurst in Gloucester County, New Brunswick, as a result of a new process for the utilization of the class of ore available there. Because the ore is of too low grade to be marketed profitably in its natural state, it is now proposed to install a new process on the ground for producing sponge iron, which will be shipped instead of ore. The first commercial plant of this kind is now in operation in Norway, where a similar class of ore is to be found. Two Canadian engineers are going to Norway to inspect the plant before it is installed at the New Brunswick mines.

It is stated that arrangements have been completed for the operation of the railroad which was constructed some years ago from a connection with the Canadian National Railways near Bathurst to the mines. Mining operations there were started in 1907, and in all about 180,000 tons of ore was taken out, but it was too low in grade to be marketed profitably in its natural state. The introduction of the new process, it is believed, will change operation of the iron mines from an unprofitable to a highly profitable venture. According to the estimate of E. Lindeman, Bureau of Mines, Ottawa, based on magnetometric surveys, the ore reserve at the Bathurst iron mines is placed at 18,600,000 tons to a depth of 500 ft.



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Small Company Plays Conspicuous Part in Manufacturing

Despite the conspicuous part played by large-scale enterprise in American economic life, the bulk of business of all kinds is still being carried on by relatively small concerns. Even in manufacturing, where large scale production is the dominant factor as measured by output and number of employees, the moderate sized plant remains the typical unit, according to the National Industrial Conference Board, 247 Park Avenue, New York.

While the growth of large scale business has been most notable in manufacturing, nearly three-fourths of all manufacturing plants in 1923 employed only 20 wage earners or less each, and about two-thirds of all plants produced goods not exceeding $100,000 in value each during the year. The dominant part played by large scale production, however, can be appraised by the fact that, on basis of 1925 data, it takes only about one-third in number of all manufacturing plants to turn out nine-tenths, in value, of all products, and that this one-third of all plants employs nearly nine-tenths of all wage earners in the industry. While thus a factory employing 1000 wage earners may be more important than 100 employing 10 workers each, significance is attached by the Conference Board to the fact that the large and the small concerns can and do exist side by side and in a highly competitive market.

Ore Shipments This Year Nearly 13 Per Cent Under 1926—November Small

CLEVELAND, Nov. 29.—Iron ore shipments by water from the Lake Superior district this year were 51,107,136 gross tons, a decrease of 7,430,719 tons, or 12.64 per cent, from last year, when the movement by water was 58,537,855 tons. In 1924, which was a light year, shipments amounted to only 42,623,840 tons. In 1925 the movement was somewhat larger than this year. The record year was 1916, when the water movement was 64,734,198 tons. All rail shipments will probably be somewhat less than 1,500,000, making the total movement for the year about 52,500,000 tons.

The shipping season closed Sunday with the dispatch of the last cargo from Superior. It was the earliest closing of the shipping season for several years. Usually a few cargoes are shipped in December. The November movement was 2,000,422 tons. Consumers took about all the ore called for by their early season schedules in spite of the slowing down in the iron and steel industry, but there was very little late season buying. Shipments by ports for November, for this and the previous year, and total shipments for ten years are listed below.

Lake Ore Shipments by Water, Gross Tons

	November Shipments	Season, 1927	Season, 1926
Escanaba	422,020	5,865,224	6,599,597
Marquette	189,749	3,238,855	3,417,462
Ashland	217,722	6,239,774	7,139,865
Superior	703,948	14,627,936	16,476,264
Duluth	301,702	15,432,188	18,638,395
Two Harbors	165,281	5,703,159	6,266,272
Total	2,000,422	51,107,136	58,537,855
1927 decrease		7,430,719	

Water Shipments of Last Ten Years, Gross Tons

1918	61,156,732	1923	59,026,092
1919	47,177,395	1924	42,623,840
1920	58,527,226	1925	54,098,492
1921	22,300,726	1926	58,537,855
1922	42,622,248	1927	51,107,136

To Make Sponge Iron in New Brunswick Mines

TORONTO, ONT., Nov. 29.—The Canadian Iron Foundries, Ltd., and other interests are contemplating mining operations on an extensive scale in the iron mines near Bathurst in Gloucester County, New Brunswick, as a result of a new process for the utilization of the class of ore available there. Because the ore is of too low grade to be marketed profitably in its natural state, it is now proposed to install a new process on the ground for producing sponge iron, which will be shipped instead of ore. The first commercial plant of this kind is now in operation in Norway, where a similar class of ore is to be found. Two Canadian engineers are going to Norway to inspect the plant before it is installed at the New Brunswick mines.

It is stated that arrangements have been completed for the operation of the railroad which was constructed some years ago from a connection with the Canadian National Railways near Bathurst to the mines. Mining operations there were started in 1907, and in all about 180,000 tons of ore was taken out, but it was too low in grade to be marketed profitably in its natural state. The introduction of the new process, it is believed, will change operation of the iron mines from an unprofitable to a highly profitable venture. According to the estimate of E. Lindeman, Bureau of Mines, Ottawa, based on magnetometric surveys, the ore reserve at the Bathurst iron mines is placed at 18,600,000 tons to a depth of 500 ft.

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This Issue in Brief

Steel frame of $15,000 house costs only $775, erected. McKay system of flexible framing solves the problem of establishing doors and window openings so that they will fit the architect's plans.—Page 1514.

Low carbon chromium steel proves highly resistant to deteriorating action of hot gases in fixation of atmospheric nitrogen. Steel with at least 2.25 per cent chromium and not more than 0.30 carbon stands up well under severe service conditions. —Page 1518.

November daily iron output was 1.75 per cent under October, estimate reveals. Telegraphed reports show daily output was 88,240 tons, lowest since August, 1925. Number of furnaces unchanged.—Page 1537.

Better business forecast by rise in P-V Line. Commodity markets are developing a stronger position; buying is likely to increase, prices to rise and production to expand. Period of improvement may extend at least through March, 1928.—Page 1528.

Today's best way of doing a job may be obsolete tomorrow. "The most that can be said of any manufacturing method is that it represents the best we know of at the present time, and we are reasonably certain that some of them will be obsolete before long," says electrical equipment manufacturer.—Page 1508.

Predicts that alloy steels will be used more and more in engineering structures. Ralph Modjeski, famous bridge engineer, foresees the discovery of "the perfect material for construction requirements"—a non-rusting and not too costly alloy, with the physical properties of steel.—Page 1511.

Quality of castings improved and costs reduced by installation of sand preparing plant. Percentage of defective castings has been materially decreased, and castings are smoother. Green sand strength is increased 50 per cent, and moisture variation has been reduced to 1 per cent.—Page 1512.

Financing stock market ventures is not the function of the Federal Reserve system. Indications point to good trade next year, for which the Federal Reserve system will supply the necessary credit. However, it cannot be expected to bolster up a share market in which stability is by no means guaranteed.—Page 1535.

Is more heat required to weld with a filler rod than without one? No, says R. A. Bull, pointing out that in either case cold steel of comparable surface area must be melted, whatever may be the merits or otherwise of using or not using imbedded rods.—Page 1536.

Copper export organization is expected to stabilize copper prices for foreign buyers. Newly formed Copper Institute will sell direct to European consumers at a published and fixed price.—Page 1534.

Large grain size is no indication of low tensile strength, says metallurgist. Proper heat treatment is beneficial to the metal in or adjoining fusion welds, irrespective of the grain size characterizing the weld deposit, says R. A. Bull.—Page 1536.

Mechanization of coal mines will only make the coal situation worse. Reduction in production cost and increase in overhead cost will result in each mechanized mine trying all the harder to run full.—Page 1535.

Machinery builders' foreign business falls off slightly. October shipments were valued at close to 34 million dollars, as against 34.3 millions in September. However, sales for first ten months are nearly 8 per cent above same period of 1926. —Page 1568.

Welded parts less than half the cost of former material. Welded motor frames are considerably cheaper than cast, says electrical equipment builder.—Page 1567.

Will Ford resumption of sales dispel the lethargy in automotive industry? Yes, says Dr. Haney. He believes the automobile business will pick up early next year, although he does not anticipate record-breaking sales.—Page 1530.

American iron and steel manufacturers are holding their own in foreign markets, which is more than foreign producers are doing in American market. Our exports for first ten months are about equal to same period of 1926, while imports have fallen off 35 per cent.—Page 1561.

A cost reduction which changes the product will be expensive if it injures salability. Any practice which results in restriction of sales nearly always increases ultimate cost. Therefore, a cost reduction is never actually proved until its effect on sales is shown.—Page 1567.

German iron and steel industry has almost effected a complete recovery. Ingot output in 1927 will be close to 1913 total, and iron output this year will be almost 70 per cent of 1913 production, despite loss of capacity due to post-war settlement.—Page 1565.

ESTABLISHED 1855

THE IRON AGE

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Stabilizing the Copper Market

ANNOUNCEMENT of the formation of the Copper Institute suggests comment on the red metal's interesting history during the last decade. The end of the great war found an expanded American industry, capable of making more copper than the civil pursuits of the entire world would require, especially in the impoverished and exhausted condition in which Europe found itself. The price of copper took a precipitate drop, and notwithstanding a brief respite in 1920, found itself at pre-war levels, and has stayed there ever since.

In view of the large increase in cost of labor, ore, fuel, machinery and transportation, it may be surprising that companies which were making a fair profit on 14-cent copper in 1912 can still exist and sell copper at 14 cents in 1927. It is only because technical advances have made possible the recovery of a higher percentage of metal from the ore and by more economical methods. Such advances, however, have simultaneously increased the capacity of existing plants, so that the American industry still remains considerably "overbuilt." Much credit is due to leading interests for maintaining operations each one at a pace roughly in keeping with the tonnage required by the customers during these years.

An early attempt was made to stimulate consumption. The Copper and Brass Research Association was organized for this purpose. Its "researches" principally took the form of marked surveys, but it financed and produced a systematic and successful publicity effort. There is no doubt that a large amount of business in window trim, roofing and gutters, hardware, and steam and water piping has been diverted to copper and brass by convincing the real estate owner—even the man with the modest home—that such durable metals are best and cheapest in the long run. Publicity created a style for copper. There are styles in metals as there are styles in fabrics.

So much for American consumption. Half the world's copper is used by us. The other half also required attention. So the Copper Export Association was formed some years back to attempt to bring order out of chaos, and especially to devise some means of thawing out the frozen capital represented by a large surplus stock of copper then on hand. This copper movement was financed, but the foreign sales situation remained unsatisfactory until the association was reorganized about a year ago to include leading European and African mines. Members of Copper Exporters, Inc., now produce at least 90 per cent of the world's copper. It operates under the export trade act, known as the Webb-Pomerene law, and reports its activities as required to the Federal Trade Commission. It aims to sell direct to the European consumer at a published and fixed price. Any member desiring to sell a certain tonnage at a lower price can do so after giving notice to the association 24 hours in advance. When that quantity is sold the fixed price is reestablished.

On the whole Copper Exporters, Inc., has been successful. In the past the London Metal Exchange, which in copper is a speculative market trading in warehouse receipts for low-grade casting copper, had a commanding influence on the world's price of electrolytic and lake copper, the important commodities. This undue influence, together with transactions through brokers, has been sharply curtailed. A European customer now knows at what price he (and his competitor) can expect to get his copper, because prices are "pegged" for several weeks or months without change.

Having already had some years' practice in cooperation through these two associations, the North and South American producers now join themselves into a statistical institute. Weekly statements of total production, total unfilled orders and total stocks, weekly average selling prices in four principal districts, and monthly totals of domestic and export sales will be published. An accounting firm will be retained to prepare a uniform system whereby the true cost of production can be determined, and tonnage procurable at various price levels determined.

Accurate, prompt and complete statements of this sort will be helpful to both seller and buyer.

After many vicissitudes the copper industry has apparently comes to realize that a live-and-let-live policy is best for everybody. In any commodity like copper, for which the demand is inelastic—that is, depends greatly upon general business sentiment—a small overproduction or a slight scarcity has a wholly disproportionate influence on price.

Assuming that the Copper Institute is able to carry on its program, the future stability of the copper business will largely depend upon the intelligence with which the resulting data are used to regulate production and purchases.

Tendencies in the Share Market

PANIC and industrial depression are commonly associated in the public mind, but students have long pointed out that there is no all-embracing connection. As the stock market discounts things as far ahead as they can be seen the panic naturally comes at the beginning of the depression. Depression can occur without a panic. We have run a month over twenty years without a panic but we have had two depressions, centering in 1914 and 1921.

In commerce there are no signs of impending depression. The outstanding feature of commerce is diminishing profits, and that does not cause depression. Inordinate profits frequently do, by encouraging undue expansion. If something new is likely to occur, as many have expected, it has been suggested that it might be a panic without a depression. Panic has always accentuated depression by enforcing liquidation of stocks and commitments, but nowadays there are practically no stocks or forward commitments.

It has been pointed out frequently in the past two years that much capital released from commerce because large stocks of commodities are no longer carried—and it makes no difference whether formerly it was the seller or the buyer who provided the capital represented in the stocks—has been going into the share market. It is both a matter of business, to find some use for the capital, and a matter of human nature, to find exercise for the speculative instinct. The disposition to buy shares has been fostered by widespread talk that the trend of the times is for the big corporations to fare better in earnings, whatever may be the fortunes of little business. That encourages people to buy shares instead of using the money in their own work.

For years after the Federal Reserve system was set up there was educative talk to the effect that the new system should not be expected to prevent or forestall all panics and depressions, but only a money panic. Apparently many have assumed that a panic in the share market can be only a money panic. If the share values are justified and can be regained, a supply of money will tide over a panicky situation. If the values are not justified and are unlikely to be regained, the Federal Reserve system could not shoulder the load and would not attempt to do so. Its function would be to supply credit to commerce, so that trade would not be depressed. For months, indeed, there has been criticism that already the reserve system was supplying too much credit to Wall Street.

In other words, there are no signs of trade reaction, but rather indications of good trade next year, while on the other hand stability in the share market is by no means guaranteed.

Coal Problem Stays a Big One

A WHITE HOUSE statement issued since representatives of the American Federation of Labor and the United Mine Workers called upon the President is to the effect that the President fully realizes that coal presents an economic problem that will have to be worked out, with suffering by both operators and miners. It indicates that the Administration will pursue a "hands-off" policy, although it is learned that the Secretary of Labor will offer to bring the former union operators and the United Mine Workers together in conference.

The problem, as the President now views it, is one of "too many mines and too many miners," just as it was years ago. The amount of information as to circumstances, as in the Coal Commission report, and the amount of clear thinking have been in inverse ratio. The three-year Jacksonville agreement was made with the sanction, if not at the instance, of the Government, with the idea that during the period there would be enough unionizing in West Virginia and Kentucky to right matters or that the union would find the scale unworkable.

It was an idle hope that the Southern fields could be unionized. Under much more favorable auspices, failure had occurred long before. It is strange indeed that so many men forgot that, when the union operators in 1898 granted the check-off, they did so in the hope that the funds thus provided would enable the union to remove the harassing non-union competition by putting up wages in those fields. The flat failure should have been recognized as permanent.

With too many miners already, strikes by the union operate to increase the surplus. Men go from other occupations into open-shop coal mining, while the striking miners go nowhere. The responsibility rests entirely upon the officials of the United Mine Workers, who encourage the members in their idleness.

It is a glaring piece of poor thinking not to recognize this and place the blame where it belongs, for increasing instead of decreasing the number of miners. Another piece of poor thinking is the suggestion that mechanization of coal mines will improve marketing conditions. It will do exactly the opposite. The more you decrease the out-of-pocket cost and increase the overhead cost, the greater the competitive condition will be. Each mechanized mine will try all the harder to run full. The longer the solution is drawn out, the more ruinous it will be.

Without a real solution, it would be a case for many years of no coal company at all being able to make profits, were it not for one circumstance, which will help in some cases, and that is the cost of transportation. A given field may get, after eliminations, to a point where it can be fully employed, at some profit, the remaining demand going to other fields having higher freights. Not many fields, of course, could prosper by the operation of this principle.

Substantial relief will come only when coal

mining shows a reasonable amount of competition among the producers for labor. That means wage rates no higher, allowing for conditions, than prevail in other classes of employment, and it requires a change of mind by men who now hold that they are and must be nothing but coal miners, whether employed or unemployed. The United Mine Workers supports them in that attitude, whereas the Department of Labor could strive to develop means to encourage them to take other employment. Coal mining will not be a success until there is this proper and natural relation between the demand for labor and the supply of labor. Public effort should be directed to hastening the advent of that condition. To support unnatural wage rates simply prolongs the agony.

Income Tax Revision

SECRETARY MELLON made recommendations to Congress of reductions in income taxation which were planned from the economic standpoint, as coming from him they would be. The committee of the House that has been framing the bill has voted a concoction with such preponderance that the whole body, and likewise the Senate, may be expected to accept it without material alteration; and this concoction is social rather than economic.

The Secretary advised a reduction in the rate on corporate income, and this the committee makes, as it ought to. The committee made no fuss at all in respect to this. Any one could understand that if a corporation were allowed to retain more of its income it would be able to do better by its stockholders. In so far as dividends accrue to nontaxpayers they will be further favored, while such as go to taxpayers will be subject to surtax. This thought makes it clear why there was no interest in reducing the surtaxes on the intermediately large incomes, a class that has not yet had any consideration in income tax reductions. The very rich have been favored for reasons of financial policy and the minor well-to-do for reasons of political policy. The intermediates, coming under neither head, are fair game to continue to pot.

The principle of inheritance tax is maintained; not that it is argued to be a soundly economic form of taxation, but owing to the rawly expressly view that it is a social rectifier.

The Treasury was of the opinion that the taxes on automobiles should be preserved inasmuch as the Government spends much money for road improvement and this is one way of causing the operators of 20 odd millions of automobiles to pay something, whereas the majority of them would not otherwise pay anything. It was advised also that the amusement taxes be retained for a similar reason. The social adjusters refer to these things as nuisance taxes. Orthodox economists call them consumption taxes, which very term is anathema to the enemies of the well-to-do. It was surprising to find the Chamber of Commerce of the United States advocating the abolition of such taxes. The committee cut the automobile tax in two and raised the exemption on amusements to $1 per ticket.

The man who had to pay to the Federal Government in 1927 a tax of $4,000 on his income of 1926 may expect in the course of 1928 to save $15 or $20 on his club dues, but if the corporations in which he holds shares should increase their dividends he may find himself in 1929 paying more in surtax than he will have saved on club dues. To him any increase in income from dividends will spell a higher rate of taxation in terms of percentage.

Of course, we are aware of the opinion entertained by some that taxes on corporations are immediately transferred to consumers, though how they can do that we do not understand. However, this view contributed to the unanimity with which the committee voted this reduction.

CORRESPONDENCE

Annealing of Welded Pipe

To the Editor: In your issue of Nov. 10, C. J. Holslag comments on the article by J. L. Avis regarding the physical properties of annealed and unannealed welded pipes, published Aug. 25. Mr. Holslag's statements prompt me to point out the following:

Experiments covering many years, thousands of steel castings, and hundreds of tensile tests of welded bars indicate clearly that the low tensile test properties obtained by Mr. Avis on specimens from the welded pipes did not result alone from the use of filler rods or slugs. I believe that low tensile test ductility values characterize ordinary shop welds made by any method with which the writer has had experience.

It is incorrect to associate large grain-size distinctively with low tensile test properties of any kind, in steel that is or is not welded.

Proper heat treatment is undoubtedly beneficial to the metal in or adjoining fusion welds, irrespective of the grain-size characterizing the weld deposit or the adjoining metal.

It is improper to assume that extra heat is required to *melt* a cold rod as compared with the heat required to *melt* the cold metal adjoining a fissure in which no supplementary piece of steel is laid. In either case cold steel of comparable surface area must be melted, whatever may be the merits otherwise of using or not using imbedded rods.

Mr. Holslag's last statement is to the effect that correct welding procedure results in moderate change in grain-size of the metal adjoining a weld. He states that under such circumstances failures have never occurred during a broad experience. He is to be complimented on account of this experience, which is unlike that of many other persons whose dependence on welding, where the personal equation is involved, has not been thoroughly satisfactory. R. A. BULL,

541 Diversey Parkway, Chicago.
Director, Electric Steel Founders' Research Group.

Steel Ties vs. Wooden Ties

To the Editor: In the Sept. 1 issue of THE IRON AGE an article signed M. H. C. urges a broad study of steel ties. It is a plea to the engineering organizations of the steel manufacturers to secure for steel "the business that belongs to steel." At the same time it infers that the reason why more steel ties are not being used is because competitors of steel, by virtue of greater foresight and business management, have developed a "nearly satisfactory substitute." The author argues that steps should be taken by the steel industry to force the substitution of steel for wood ties.

If he is sincere in his statement regarding securing for steel the business that belongs to steel, it is likely that railroad engineers generally will agree with him. But he certainly must be aware of the efforts during the past 20 or 30 years, on the part of the steel industry, and railroad engineers as well, to develop a satisfactory substitute for wood ties. This has not been confined to steel alone, but includes combinations of steel and concrete, concrete and wood and steel and wood as well, and some of the best brains in the two industries have been working on this problem. M. H. C.

thinks that it is a question of developing a "nearly satisfactory substitute for the steel tie." It has rather been a case of trying to develop a more nearly satisfactory substitute for the wood tie.

The Tie Committee of the A. E. R. E. A. has studied this question carefully for many years, and the steam railroads have made many experimental installations of different types of substitute ties. Reports on the results of these installations are available to any one who may care to study them. Certainly the electric railway industry has experimented with steel and other forms of substitute ties on a fairly large scale. In many instances the results obtained have been not only unsatisfactory, but disastrous financially as well.

The question of steel or other substitutes for the wood tie is purely one of economics. And in the use of the term wood tie we of course mean treated timber, because no company can afford to use untreated timber for ties. Does M. H. C. mean to imply that railroad engineers are not alive to the importance and necessity for timber conservation? That this is not so is borne out by the fact that the annual consumption of wood ties for renewals is now approximately 100 million; whereas, if no treated timber were used for this purpose, the requirements would be more than 50 per cent greater. With about 400 million untreated ties still in service, and with treated ties being installed at the rate of about 65 million a year, it will not be many years before the wood tie situation will be even more favorable than at present. The need for a substitute is rapidly disappearing.

Preservative treatment of timber has not only increased the life of the previously acceptable timber for ties, but has also greatly increased the field of timber available for this purpose, so that, if wood preservation is generally adopted, we are now assured of a dependable and economical supply of wood. While M. H. C.'s argument to increase the steel output 2,500,000 tons a year is commendable from the steel manufacturer's point of view, it shows a lack of knowledge of all the facts regarding the existing situation. It will have to be presented in a more convincing way before the steel industry would be justified in increasing its present investment in steel tie producing machinery. The questions raised by M. H. C. have been answered to the satisfaction of the majority of the railroad engineers of the country. The 100 per cent satisfactory substitute for the wood tie has yet to be produced, although the United States Patent Office records contain many designs intended to accomplish this result.

HOWARD H. GEORGE,

Chairman, Committee on Way and Structures, American Electric Railway Engineering Association.
Newark, N. J., Nov. 2.

Iron Output Shows Loss in November

Preliminary Estimates Gathered by Wire, Show Daily Rate 1570 Tons, or 1.75 Per Cent Less Than October— No Loss in Active Furnaces

PRELIMINARY returns gathered by wire on Tuesday, Nov. 29, show that the estimated pig iron production for November was 2,647,200 gross tons. These data include estimates of the output for the last two days by the companies sending in the compilations. Only four furnaces were estimated in this office.

The November production, thus estimated, was 88,240 tons per day, which compares with 89,810 tons per day in October—a loss of 1570 tons in the daily rate or about 1.75 per cent. This is the smallest output this year and compares with a daily rate of 107,890 tons in November, 1926.

No Gain or Loss in Furnaces

With three furnaces blown in and three blown out, there was no gain or loss in actual stacks in operation. At the end of November there were 172 furnaces in blast, the same as on Nov. 1. The Steel Corporation blew in two furnaces and there was one merchant stack started; the independent steel companies blew out two furnaces, and the merchant, one.

Furnaces Blown In and Out

During November only three furnaces were blown in and only three blown out. The three furnaces which were blown in were one Clairton furnace of the Carnegie Steel Co. in the Pittsburgh district; one South Chicago furnace of the Illinois Steel Co. in the Chicago district, and one Detroit furnace of the M. A. Hanna Co. in Michigan. The three furnaces which were blown out were two Bethlehem Steel Corporation stacks, one at the Bethlehem plant in the Lehigh Valley and one at the Coatesville plant in the Schuylkill Valley and the Claire furnace in the Shenango Valley.

Production by Districts

The estimated November production by districts is given in the table. The actual output for November will be published in THE IRON AGE, Dec. 8.

Pig Iron Production by Districts, Gross Tons

	Nov. (30 days)	Oct. (31 days)	Sept. (30 days)	Aug. (31 days)
New York and Mass.	212,819	232,422	222,485	231,625
Lehigh Valley	75,600	81,829	86,398	88,451
Schuylkill Valley	53,208	64,260	52,256	37,284
Lower Susq. and Lebanon Valleys	30,415	31,828	30,349	31,244
Pittsburgh district	495,227	540,525	555,384	580,459
Shenango Valley	65,095	77,106	83,919	98,687
Western Penna.	91,626	93,010	91,774	96,833
Maryland, Virginia and Kentucky	91,030	88,991	80,973	95,528
Wheeling district	109,815	110,222	114,357	130,065
Mahoning Valley	222,090	245,625	248,834	265,726
Central and Northern Ohio	306,561	324,793	311,141	327,703
Southern Ohio	33,000	32,954	25,636	27,046
Illinois and Indiana	508,071	506,438	533,686	572,623
Mich., Minn., Mo., Wis., Colo. and Utah	124,539	121,203	122,309	140,069
Alabama	220,262	224,533	207,363	212,337
Tennessee	7,842	8,373	8,085	11,596
Total	2,647,200	2,784,112	2,774,949	2,947,276

Steel Corporation Makes No Changes in Organization

No decision with regard to changes in the organization was made by the board of directors of the United States Steel Corporation at its regular meeting in New York, Tuesday afternoon, Nov. 29. It had been widely expected that definite action would be taken at least in respect to the election of a chairman of the finance committee of the corporation and possibly in relation to a realinement of the scheme of organization. The announcement issued from the meeting was as follows:

> The board of directors met today. They have not as yet decided on what, if any, changes are desirable in the organization of the company and consequently have taken no action.
> Nov. 29, 1927.

Further decided increase in the employment of mechanical cutters by the South African coal mines is disclosed in the annual report of the Secretary of Mines and Industries for 1926, according to Assistant Trade Commissioner William L. Kilcoin, Johannesburg. According to this report the number in use at the end of the year was 631, an increase of 102 over 1925. Of this total 102 were electrical and 529 compressed air machines.

Iron and Steel Markets

Steel Production Gains Slightly

New Nail Card Evidences Efforts to Stiffen Price Structure —Low Output and Prices of Pig Iron— Silvery Iron Reduced $2

CONSUMPTION of steel remains steady, judged by the full volume of specifications going to the mills. The Youngstown district is now making more steel, and some expansion in the Chicago district more than balances a recession in the South. A number of mills have higher operating schedules for December, and the general expectation is for a rising scale of activity in bookings and production early in 1928.

It remains that the price structure is still awaiting the telling test. The large tonnage of plates, shapes and bars closed prior to the recent advance will satisfy needs extending into next year, and fresh buying meanwhile has been of small proportions.

Sheets, strips and wire have lost any advances they had during the year, and a new low for recent years of 4c., Pittsburgh, has been reached in autobody sheets. Several correctives, aside from efforts to lift base prices, are in the making. A new card of increased extras for sheets of widths beyond the scope of continuous mills is under consideration.

On nails, the leading producer has issued a new card of extras effective Dec. 1, which calls for 25c. a keg additional on 10 to 60-penny common nails, formerly taking the base price, and it has named a base price for December and the first quarter of 1928 of $2.55 a keg, Pittsburgh, or $2.60, Chicago. Carload orders will be allowed a 10 per cent discount.

Announcement of next season's price for tin plate, expected within a week, will represent, it is believed, a level above most of the concessions which came to be made from the last established $5.50 a base box quotation.

Production of pig iron in November was practically on a parity with October. Returns collected by telegraph indicate an output for the 30 days of the month of 2,647,200 gross tons, comparing with 2,784,112 tons for October. The daily averages are 88,240 tons for November and 89,810 tons for October. Both are the lowest since August, 1925.

The number of active blast furnaces remains unchanged, the month beginning and ending with 172 stacks in operation. Two Steel Corporation furnaces replaced two belonging to independent steel companies, and one merchant stack went out and one went in. Comparing 11-month periods, 1927 is 6.8 per cent off from 1926, but slightly ahead of 1925, which was a 36,400,000-ton year.

Rail orders continue notable. Chicago mills covered for nearly 40,000 tons, including part of 47,000 tons for the Erie. The Boston & Albany bought 6500 tons of Bethlehem for January and February delivery, with an option for 2500 tons additional. The Missouri Pacific system is in the market for 60,000 tons. Of track accessories, 30,000 tons were booked and 75,000 tons remain on inquiry.

The Chicago & North Western has ordered 350 freight cars and 500 car bodies, has still on inquiry 1000 cars and may buy 2000 automobile cars. The Chicago & Eastern Illinois wants 500 automobile cars and the Baltimore & Ohio's requirements are put at 2000 hopper car bodies.

Structural steel awards of 28,000 tons were about double those of the preceding week, while fresh projects total more than 19,000 tons.

Although a 5000-ton lot of sheets was placed by the Ford Motor Co., together with releases on tonnages previously bought, not a great deal is expected from this company before January. Weakness in sheets has followed generally lighter purchases and lack of confidence among buyers as to the end of the decline. Wide strips have sold at the plate base.

Valley foundry iron has broken 25c. a ton on purchases of 30,000 tons by a sanitary company for first half shipment to its Pittsburgh district plants. Basic iron in eastern Pennsylvania has declined 50c. on large orders, and the Chicago market is disturbed by concessions of 50c. a ton on Lake Erie foundry iron brought in by boat. Aside from the purchases by the sanitary ware manufacturer, which placed a total of close to 70,000 tons for all of its foundries, the week brought out little buying for 1928 delivery.

Prices of silvery iron and Bessemer ferrosilicon have been reduced $2 a ton on deliveries over the remainder of the year and in first quarter.

Exports of iron and steel in October were 170,255 tons. More than 25,000 tons of scrap was included, bringing scrap exports for ten months above 200,000 tons. Total exports for the ten months, 1,834,613 tons, were 85,000 tons ahead of 1926.

Imports of iron and steel in ten months show a decline of 35 per cent, to 624,397 tons, due largely to a drop of 311,000 tons in imports of pig iron. Structural shapes made a gain of 37,500 tons and wrought pipe of 25,000 tons.

THE IRON AGE composite price of pig iron is down to $17.59, from $17.63 last week and the week before. Finished steel remains unchanged at 2.307c. for a second week.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Nov. 29, 1927	Nov. 22, 1927	Nov. 1, 1927	Nov. 30, 1926
No. 2, fdy., Philadelphia..	$19.76	$19.76	$19.76	$23.26
No. 2, Valley furnace....	*17.25*	17.50	17.50	19.00
No. 2, Southern, Cin'ti...	19.69	19.69	19.69	23.69
No. 2, Birmingham.....	16.00	16.00	16.00	20.00
No. 2 foundry, Chicago*..	18.50	18.50	18.50	21.00
Basic, del'd eastern Pa. ..	*19.00*	19.50	20.00	22.50
Basic, Valley furnace....	17.00	17.00	17.00	18.50
Valley Bessemer, del'd P'gh	19.76	19.76	19.76	21.76
Malleable, Chicago*	18.50	18.50	18.50	21.00
Malleable, Valley	17.50	17.50	17.50	19.00
Gray forge, Pittsburgh...	*18.51*	18.76	18.76	20.26
L. S. charcoal, Chicago...	27.04	27.04	27.04	27.04
Ferromanganese, furnace.	90.00	90.00	90.00	100.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill.	$43.00	$43.00	$43.00	$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh..	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh...	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh....	34.00	34.00	34.00	36.00
Forging billets, P'gh.....	38.00	38.00	38.00	40.00
O.-h. billets, Phila.	38.30	38.30	38.30	40.30
Wire rods, Pittsburgh....	40.00	40.00	42.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.75	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.07	2.22
Iron bars, Chicago.....	1.90	1.90	1.85	2.00
Steel bars, Pittsburgh....	1.80	1.80	1.75	2.00
Steel bars, Chicago.....	1.90	1.90	1.85	2.10
Steel bars, New York.....	2.14	2.14	2.09	2.34
Tank plates, Pittsburgh..	1.80	1.80	1.75	1.90
Tank plates, Chicago.....	1.90	1.90	1.85	2.10
Tank plates, New York...	2.14	2.14	2.09	2.24
Beams, Pittsburgh	1.80	1.80	1.75	2.00
Beams, Chicago	1.90	1.90	1.85	2.10
Beams, New York.....	2.14	2.14	2.09	2.34
Steel hoops, Pittsburgh...	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Nov. 29, 1927	Nov. 22, 1927	Nov. 1, 1927	Nov. 30, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.75	2.75	2.80	3.00
Sheets, black, No. 24, Chicago dist. mill.....	2.90	2.90	3.00	3.20
Sheets, galv., No. 24, P'gh	*3.60*	3.65	3.70	3.85
Sheets, galv., No. 24, Chicago dist. mill.....	3.75	3.75	3.85	4.05
Sheets, blue, 9 & 10, P'gh	2.10	2.10	2.10	2.30
Sheets, blue, 9 & 10, Chicago dist. mill.....	*2.15*	2.20	2.25	2.50
Wire nails, Pittsburgh....	2.50	2.50	2.50	2.65
Wire nails, Chicago dist. mill	2.55	2.55	2.55	2.70
Plain wire, Pittsburgh....	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh..	3.20	3.20	3.20	3.35
Barbed wire, galv., Chicago dist. mill.....	3.25	3.25	3.25	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh.	**$14.50**	$14.25	$14.50	$17.00
Heavy melting steel, Phila.	13.50	13.50	14.00	15.50
Heavy melting steel, Ch'go	11.50	11.50	11.50	13.00
Carwheels, Chicago	13.25	13.25	13.25	14.50
Carwheels, Philadelphia ..	15.50	15.50	15.50	16.50
No. 1 cast, Pittsburgh....	14.25	14.25	14.75	16.00
No. 1 cast, Philadelphia..	16.00	16.00	16.50	17.00
No. 1 cast, Ch'go (net ton)	13.50	13.50	13.50	16.00
No. 1 RR. wrot, Phila....	15.25	15.25	15.50	17.00
No. 1 RR. wrot, Ch'go (net)	**9.75**	9.50	9.75	12.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt....	$2.75	$2.75	$2.85	$3.90
Foundry coke, prompt....	3.75	3.75	4.00	5.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	13.75	13.75	13.25	13.75
Electrolytic copper, refinery	13.50	13.50	13.00	13.37½
Zinc, St. Louis.....	**5.90**	5.82½	5.80	7.15
Zinc, New York.....	**6.25**	6.17½	6.15	7.50
Lead, St. Louis.....	**6.10**	6.05	5.95	7.80
Lead, New York.....	**6.40**	6.25	6.25	8.00
Tin (Straits), New York..	**59.12½**	58.12½	57.50	71.75
Antimony (Asiatic), N. Y.	10.87½	10.87½	11.00	14.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Another Advance in Heavy Melting Scrap —Pig Iron Declines on Standard Sanitary Purchase

PITTSBURGH, Nov. 29.—The cheerful feeling that recently made its appearance in the steel industry has begun to be reflected in larger aggregate purchases, and some of the mills having a diversified line of products have definitely higher operating schedules for December. It can be repeated, however, that the story for 1927 has been written, as whatever increase there may be in the engagement of productive capacity in the final month of the year will be largely in the filling of orders for material that will hardly enter consumption before the new year. Satisfaction over the gain in orders is modified not only by the fact that there are few which can be shipped out promptly, but also by the fact that in the lighter forms, notably sheets and strips, it has been necessary to extend low and unsatisfactory prices into the new year.

There seems to have been such heavy coverage of buyers of plates, shapes and bars prior to the recent advance in prices that it remains that the advance is yet to be fully established. Little doubt now exists that the first quarter of the new year will be marked by a rising scale of activity in both bookings and mill operations, but the business generally will carry the prices that are commonly regarded as too low.

Sheets, strips and wire products have lost any advances they made during the year, and a new low-record price for recent years has been reached on automobile body sheets, which have dipped to 4c., base. Some interpret the delay that has marked the announcement of the price of tin plate for the first half of next year as meaning that the extent of the reduction, rather than the maintenance of the present price, is being seriously considered. Some effort is being made to stiffen the prices of cold-finished steel bars, but success in that direction seems to hinge on the maintenance of the 1.80c. base on hot-rolled bars.

The Youngstown district is making more steel, but the general average of steel works engagement in the Greater Pittsburgh district shows no particular change. November will probably show the lightest steel output of any month of the year. The Carnegie Steel Co. recently lighted one of its Clairton blast furnaces, but the furnace of the Reliance Coke & Furnace Co. was blown out last Sunday, leaving 58 of 125 furnaces active in the district.

The pig iron market has been enlivened by the Standard Sanitary Mfg. Co.'s purchase of its first half of 1928 requirements, amounting to between 60,000 and 70,000 tons. Reports are conflicting as to the prices on this tonnage, but commonly the buyer is conceded to have been the winner. Heavy melting steel is held more firmly as a result of recent purchases, which turn out to have been made primarily for the purpose of reducing buyers' average costs. Hardly any market exists for coal or coke.

Pig Iron.—The Standard Sanitary Mfg. Co. in the past week completed the purchase of its foundry iron requirements for its several plants for the first half

of next year. Total purchases were between 60,000 and 70,000 tons, approximately 30,000 tons being taken for its Pittsburgh and New Brighton, Pa., works, 25,000 tons for its Louisville, Ky., plant, 6000 tons for Baltimore, bought about two weeks ago, and 4000 tons for its Pacific Coast plant. Since the purchases of this company have considerable bearing upon the general market prices in the centers in which it buys, little information has been given out as to the latest purchases. The common report here is that the Valley iron sold at $17.25 for No. 2 and $17.50 for No. 2X, but there are also reports that 25c. per ton less was done. The company succeeded in getting an extension of the present base price of $16, Birmingham, for No. 2 grade, which was supposed to have expired this month, to cover the first half of next year. It also obtained an extension of present prices at St. Louis and at the Lake furnaces. Southern Ohio iron does not appear to have figured in the sales. Valley furnace interests are still quoting the base foundry grade at $17.50, but have not been successful in selling more than single carloads at that price. The market is purely nominal on other grades, but a sizable inquiry for malleable probably would bring out less than the present quotation of $17.50, Valley furnace, and there are reports that Bessemer iron is not altogether solid at $18, Valley furnace, while there is a little too much basic iron available at nearby furnaces for the Valley market to mean much to melters in the Pittsburgh district.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.00
Bessemer	18.00
Gray forge	$16.75 to 17.00
No. 2 foundry	17.25 to 17.50
No. 3 foundry	16.75 to 17.00
Malleable	17.50
Low phosphorus, copper free	27.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Producers of ferromanganese will probably name prices on early 1928 tonnages this week, and the expectation is that $95 or $100, Atlantic seaboard, will be announced, with the higher rather than the lower figure more commonly looked for. Business is at a standstill, awaiting the price announcement. The same dullness also exists in ferrosilicon, next year's prices of which are yet to come out. Producers of spiegeleisen want higher prices on first quarter contract tonnages than they are willing to accept on orders for early shipment.

Semi-Finished Steel.—No change can be reported in the market for billets, slabs and sheet bars. While there has been a little quickening in the demand for sheets as a result of the low prices lately reached, non-integrated manufacturers appear to be getting along with a minimum of sheet bars and are pursuing a course with regard to purchases calculated to make the sheet bar producers help them to profits at today's sheet prices. At the same time, they are unable to offer tonnages of a size to induce concessions. Much the same situation exists in strips, which provide the principal use for billets and slabs that are marketed. Real activity is lacking in strips, and prices are said to be unprofitable with billets and slabs at $33. No first quarter contracting is noted, but then quarterly contracting in the past few years has given way to buying at shorter range. Skelp is held at 1.80c. Wire rods still show a range, but most of the tonnage is moving at $40, base Pittsburgh.

Wire Products.—Business is neither better nor worse, and is about the usual volume of this time of year, when distributers are governed in purchases chiefly by inventory considerations. Prices are still irregular, particularly on nails. Local mills are quoting $2.50, base per keg, Pittsburgh, and in the immediate Pittsburgh district have some measure of success in obtaining that price. But there is sharp competition, and it is more accurate to state that the market is quotable at $2.50, subject to some shading. Away from Pittsburgh, prices depend upon local conditions.

Rails and Track Supplies.—Sales of track accessories, though still small individually, are more numerous. Light-section rails are selling steadily in small lots at unchanged prices. Boat and bar spikes are easier.

Tubular Goods.—There is a better feeling in the pipe market, but it seems to be based on expectations for 1928 and the fact that the recent price reduction, through a revision of the supplementary discounts, has provided stability without the necessity of a new price card, rather than because of the size of the current demand. Besides the recent large line pipe orders, there is a steady movement of smaller tonnages and the promise of two or three big ones projected for the early part of next year. Standard-weight pipe is moving as well as could be expected at this time of the year, when jobbers do not want to add to their stocks. Oil country goods will probably be in better demand later. Pipe mill operations have risen slightly in the past week or 10 days, largely because of the Amarillo-Denver gas pipe line and the oil line of the Roxana Petroleum Co., the latter, aggregating 70,000 tons of 6, 8 and 10-in. pipe, having gone to the Youngstown Sheet & Tube Co. Tubes await demands from the railroad and automobile industries.

Sheets.—Prices have had a fresh downturn in the past week. What remained of the advance announced last May has been wiped out, while automobile sheets have dipped to the lowest point of the year, having gone as low as 4c., base Pittsburgh. The market now is openly quoted at 2.75c. to 2.80c., base Pittsburgh, for black; 3.60c. to 3.65c., base, for galvanized; 2.10c. to 2.15c., base, for blue annealed; 2.85c. to 3c., base (No. 28 gage), for tin mill black plate; while automobile body sheets range from 4c. to 4.15c., base, and metal furniture sheets are based on 2.80c. to 2.90c. for black sheets instead of 2.90c. to 3c., as heretofore. A fair amount of tonnage is being taken at these prices, but there is not the confident demand that there would be if buyers were satisfied that the end of the decline was at hand. Competition for orders is still a little too keen for any such conclusion. The lower price on automobile body sheets is said to have been brought

The Iron Age Composite Prices

Finished Steel

Nov. 29, 1927, 2.307c. a Lb.

One week ago	2.307c.
One month ago	2.293c.
One year ago	2.453c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

Nov. 29, 1927, $17.59 a Gross Ton

One week ago	$17.63
One month ago	17.54
One year ago	20.13
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

	Soft Steel Base Per Lb.
F.o.b. Pittsburgh mills	1.80c.
F.o.b. Chicago	1.90c.
Del'd Philadelphia	2.12c.
Del'd New York	2.14c.
Del'd Cleveland	1.99c.
F.o.b. Cleveland	1.80c.
F.o.b. Birmingham	1.95c. to 2.05c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.
Billet Steel Reinforcing	
F.o.b. Pittsburgh mills	1.80c. to 1.90c.
F.o.b. Birmingham	2.00c. to 2.10c.
Rail Steel	
F.o.b. mills east of Chicago district	1.65c to 1.70c.
F.o.b. Chicago	1.80c.
Iron	
Common iron, f.o.b. Chicago	1.90c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c.
F.o.b. Chicago	1.90c.
F.o.b. Birmingham	1.95c. to 2.05c.
Del'd Cleveland	1.99c.
Del'd Philadelphia	2.12c.
Del'd New York	2.14c.
C.i.f. Pacific ports	2.40c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c.
F.o.b. Chicago	1.90c.
F.o.b. Birmingham	1.95c. to 2.05c.
Del'd Cleveland	1.99c.
Del'd Philadelphia	2.12c.
Del'd New York	2.14c.
C.i.f. Pacific ports	2.40c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, 2 in. and narrower, P'gh	2.20c. to 2.30c.
All gages, wider than 2 in., to 6 in., P'gh	2.10c. to 2.15c.
*All gages, 6 in. and wider, P'gh	1.85c. to 1.90c.
All gages, narrower than 6 in., Chicago	2.40c.
All gages, 6 in. and wider, Chicago	2.20c. to 2.40c.

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.10c. to 2.20c.
Bars, f.o.b. Chicago	2.10c. to 2.20c.
Bars, Cleveland	2.10c. to 2.25c.
Shafting, ground, f.o.b. mill	*2.35c. to 2.80c.
Strips, under 12 in., 1 up to 3 tons, P'gh	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, Cleveland	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, del'd Chicago	3.30c. to 3.45c.
Strips, under 12 in., 1 up to 3 tons, Worcester	3.15c. to 3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)	Base Per Keg
Wire nails	$2.50
Galvanized nails	4.50
Galvanized staples	3.20
Polished staples	2.95
Cement coated nails	2.50
	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.20
Barbed wire, painted	2.95

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.10c. to 2.15c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.15c. to 2.25c.
Nos. 9 and 10, del'd Cleveland	2.19c. to 2.29c.
Nos. 9 and 10, del'd Philadelphia	2.42c. to 2.47c.
Nos. 9 and 10, f.o.b. Birmingham	2.35c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.75c. to 2.80c.
No. 24, f.o.b. Chicago dist. mill	2.90c.
No. 24, del'd Cleveland	2.94c. to 2.99c.
No. 24, del'd Philadelphia	3.07c. to 3.22c.
No. 24, f.o.b. Birmingham	3.05c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.95c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade	3.75c. to 3.85c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.60c. to 3.65c.
No. 24, f.o.b. Chicago dist. mill	3.75c.
No. 24, del'd Cleveland	3.74c. to 3.84c.
No. 24, del'd Philadelphia	3.97c. to 4.07c.
No. 24, f.o.b. Birmingham	3.95c. to 4.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.85c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill	3.00c. to 3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.00c. to 4.15c.

Long Ternes

No. 28, 8-lb. coating, f.o.b. mill primes	4.20c.
No. 28, 8-lb. coating, f.o.b. mill unassorted	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating I.C. $11.40	25-lb. coating I.C. $17.30
15-lb. coating I.C. 14.45	30-lb. coating I.C. 18.75
20-lb. coating I.C. 15.80	40-lb. coating I.C. 20.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series Numbers	Base Per 100 Lb.
2100* (1½% Nickel, 0.10% to 0.20% Carbon)	$2.90 to $3.00
2300 (3½% Nickel)	4.00 to 4.10
2500 (5% Nickel)	5.00 to 5.25
3100 (Nickel Chromium)	3.00 to 3.10
3200 (Nickel Chromium)	4.75 to 5.00
3300 (Nickel Chromium)	6.75 to 7.00
3400 (Nickel Chromium)	6.00 to 6.25
5100 (Chromium Steel)	3.10 to 3.20
5200* (Chromium Steel)	7.00 to 7.50
6100 (Chrom. Vanadium bars)	4.00 to 4.15
6100 (Chrom. Vanad. spring steel)	3.60 to 3.80
9250 (Silicon Manganese spring steel)	3.00 to 3.15
Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.10 to 4.30
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.00 to 4.25
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.10 to 3.20
Chromium Molybdenum spring steel (1 — 1.25 Chrom., 0.30 — 0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	$2.75 to 2.80
Spikes, boat and barge	3.10
Tie plates, steel	2.25
Angle, bars	2.75
Track bolts, to steam railroads	3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count, 70 per cent off list	

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	45	32½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5 and 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

about by purchases by body builders serving the Ford Motor Co. which usually enjoy a preferential of $3 a ton. Since the news is out, however, it will be hard to convince other users why they should pay more. The more probable basis for the decline is the fact that, as black sheets had previously eased off as much as $5 a ton, it was impossible to maintain the former body sheet price. Mill operations range from 60 to 65 per cent of capacity.

Tin Plate.—Announcement of the price to rule on first half of 1928 contracts is still deferred. Mill operations average under, rather than above, 60 per cent of capacity, as there is less than the usual demand for tin plate for packing salmon and mill engagement is provided chiefly by general line and export demands, with a little rolling against early 1928 requirements to be shipped out this year and invoiced Jan. 2 next.

Cold-Finished Steel Bars and Shafting.—Makers are looking ahead to the first quarter and will probably open books this week for contracts for that period. A firmer price stand is probable on account of the recent stiffening in hot-rolled bar prices. Demand comes from well diversified sources, but individual orders are still small. No appreciable quickening in the demand from automobile parts makers is yet noted.

Bars, Plates and Shapes.—Mills in this and nearby districts are adhering firmly to 1.80c., base Pittsburgh, on lots of a carload or more, but have not been particularly successful in making sales at that price. Buyers generally have orders in at lower figures and, when they specify against them, make an effort to put off shipments until the end of December or early January. So far the double price scheme, one for large and one for small lots, is more of a theory than a fact. Since some of the large fabricating shops are reasonably well filled up, there seems to be somewhat less competition and slightly better prices on recent lettings. Business is still livelier in steel bars than that in shapes and plates. The Allegheny County Commissioners will take bids until Dec. 14 on a seven-girder span highway bridge at Duquesne, Pa., requiring about 1200 tons.

Hot-Rolled Flats.—Very narrow material, more commonly referred to as cooperage stock, is still holding well in price, but the market favors the buyers on other widths. First quarter bookings are fairly heavy, but current demands are light.

Cold-Rolled Strips.—The market is now commonly 3c., base Pittsburgh, subject to a deduction of 25c. per 100 lb. for lots of 3 tons or more. There is still a quotation of 3.15c., but only retail lots are moving at that figure in the territories where individual sales are small and the buyers are exacting as to quality, finish, etc. First quarter business is coming in fairly well at 2.75c., net, but early shipment orders are few and small.

Bolts, Nuts and Rivets.—If the bolt and nut market were as active as it is firm, the situation would provide no occasion for complaint, but business is very sluggish. Makers are preparing to open books for first quarter contracts, and present prices will probably be continued. Buyers of large rivets will be given an opportunity to cover for the first quarter at the same price that ruled for this quarter, or $2.75, base Pittsburgh or Cleveland.

Warehouse Business.—The price schedule that has been in effect for some time is still observed, but a revision of sheet prices appears likely in view of the fresh weakness in mill prices. Business is not active, and some are finding that sales are running behind this time last year, which was not notable for activity.

Coke and Coal.—A sale of between 2500 and 3000 tons of furnace coke for shipment during December to an Eastern interest that requires coke of good structure, but is not exacting as to sulphur content, at $2.75 per net ton at ovens, stands out in an otherwise dull and uninteresting market. Spot furnace coke is still available at $2.75. Spot foundry coke seems to have found somewhat better sale in the past week, but at no advance in prices. Heating coke is almost unsalable on account of mild weather, and finding a place for the coal that is being produced is still the problem of the producers.

Old Material.—Purchases of heavy melting steel by steel makers because they regard prices as low, rather than because they see an immediate need of it, have further stiffened local prices of that material, which is now quotable at $14.50 to $15, generally at $14.50 to $14.75, the higher figure applying only on some strictly No. 1 railroad steel. Dealers will make little money on their most recent sales, but since part of these transactions is a release of suspended tonnages carrying higher prices, they will net a fair profit on the combined deals. At the same time the mills will bring down their averages from around $15.25 to $15.50 to about $14.75. Not much of this grade is now being offered, and the general market gives signs of shaping for an advance with the advent of a new buying movement. The December scrap list of the Baltimore & Ohio Railroad contains 18,150 gross tons.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$14.50 to $15.00
Scrap rails	14.00 to 14.50
Compressed sheet steel	13.75 to 14.00
Bundled sheets, sides and ends	12.75 to 13.00
Cast iron carwheels	14.00 to 14.50
Sheet bar crops, ordinary	14.50 to 15.00
Heavy breakable cast	13.25 to 13.75
No. 2 railroad wrought	14.50 to 15.00
Heavy steel axle turnings	13.00 to 13.50
Machine shop turnings	11.00 to 11.50
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	16.00 to 16.50
Railroad coil and leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phosphorus billet and bloom ends	18.50 to 19.00
Low phosphorus, mill plate	17.50 to 18.00
Low phosphorus, light grade	16.50 to 17.00
Low phosphorus sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	13.00 to 13.50
Electric Furnace Grades:	
Low phosphorus punchings	16.50 to 17.00
Heavy steel axle turnings	13.00 to 13.50
Blast Furnace Grades:	
Short shoveling steel turnings	11.00 to 11.50
Short mixed borings and turnings	11.00 to 11.50
Cast iron borings	11.00 to 11.50
No. 2 busheling	8.00 to 8.50
Rolling Mill Grades:	
Steel car axles	18.00 to 19.00
No. 1 railroad wrought	11.00 to 11.50
Sheet bar crops	17.00 to 17.50
Cupola Grades:	
No. 1 cast	14.25 to 14.75
Rails 3 ft. and under	15.00 to 15.50
Malleable Grades:	
Railroad	14.50 to 15.00
Industrial	14.00 to 14.50
Agricultural	13.50 to 14.00

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.65c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.20c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	62½ per cent off list
Machine bolts, per 100 count.	62½ per cent off list
Carriage bolts, per 100 count.	62½ per cent off list
Nuts, all styles, per 100 count,	62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb.	2.90
Wire, galvanized soft, base per 100 lb.	2.90
Common wire nails, per keg	$2.80 to 2.90
Cement coated nails, per keg	2.85 to 2.95

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾ in.	$33.50 to 34.00
Forging, ordinary	38.00 to 39.00
Forging, guaranteed	43.00 to 44.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.80c.
Sheared	1.80c.
Universal	1.80c.

Wire Rods

	Per Gross Ton
*Common soft, base	$40.00 to $42.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $42 to $43. Cleveland mill base, $40.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.50c.
Iron ore, Swedish, average 66% iron,	9.75c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c. to 40c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.10 to $10.35
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75 to $3.00
Foundry, f.o.b. Connellsville prompt	3.75 to 4.50
Foundry, by-product, Ch'go ovens	9.00
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.45 to 9.85
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.65 to 1.85
Mine run gas coal, f.o.b. Pa. mines	1.85 to 2.00
Steam slack, f.o.b. W. Pa. mines	0.80 to 1.00
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$30.00
Domestic, 16 to 19%	29.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00

Per Gross Ton Furnace		*Per Gross Ton Furnace*	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd ..... 93c. to 95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads ..... 11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace ..... $3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads $200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton $91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton $122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$16.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	———
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled threads up to and including ⅜ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discount of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75 to $3.00
F.o.b. Chicago	2.85 to 3.10

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

New Extra Card on Nails—Silvery and Bessemer Ferrosilicon Decline $2

CHICAGO, Nov. 29.—The leading producer of nails is issuing a new card of extras, effective Dec. 1, which places an extra of 25c. on 20 to 60d common nails, which formerly carried the base price. Other similar changes are made on standard nails, but no change is made in coated nails. Announcement is also made that carload orders will be allowed a 10 per cent discount on the basis of the new card. All old prices and quotations have been withdrawn, and the base prices named for December and the first quarter are $2.55, Pittsburgh, and $2.60, Chicago.

New orders and fresh inquiries for rails still hold the interest of Chicago producers, though there is a better tone in the structural shape market as a result of more liberal orders for small tonnages and the clearing of air rights which may lead the way to orders for over 50,000 tons of steel.

The Chicago & North Western has ordered 350 freight cars and 500 hopper car bodies. That railroad still has 1000 cars on inquiry, and the trade expects it to ask for prices on 2000 automobile cars. An inquiry for 500 automobile cars has been issued by the Chicago & Eastern Illinois.

Specifications in finished steel are heavier, and this fact, coupled with larger releases on rail contracts, is affording mills an ingot output of close to 63 per cent of capacity. Although first quarter prices have not been announced on plates, shapes and bars, it is rather generally believed that 1.90c. will be named.

Pig Iron.—Schedules on silvery iron and Bessemer ferrosilicon have been revised downward $2 a ton for delivery over the remainder of this year and in the first quarter of 1928. The announcement of lower prices has resulted in booking between 2000 and 3000 tons of this commodity. Prices for pig iron lack firmness, notwithstanding that both sales and specifications are measurably heavier. A cargo of iron, about 6000 tons, is being unloaded at a local dock and distributed at prices that range from $18 to $18.50. Local producers, however, are holding firmly to $18.50, f.o.b. local furnace. Fresh inquiry includes two 1000-ton lots, and several sales of 1000 tons each are reported. Low stocks in the hands of buyers are leading to numerous small purchases to piece out requirements for the rest of the year, whereas large orders are for delivery after Jan. 1. An inquiry for 500 tons of low phosphorus iron is before the trade.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$18.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	19.00
Malleable, not over 2.25 sil.	18.50
High phosphorus	18.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	22.01
Southern No. 2 (barge and rail)	20.18
Low phos., sil. 1 to 2 per cent, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Further weakness is shown in prices for spiegeleisen, which is now freely quoted in the 19 to 21 per cent grade at $30, Hazard, Pa., or $37.76, delivered, in carload lots. A car of ferrosilicon for delivery in December brought $87.50, delivered. Producers are still withholding announcement of 1928 contract prices. The ferromanganese market is dull, and prices remain at $90, seaboard, though reports are again current that the price is to be advanced for next year's delivery.

Prices delivered Chicago: 80 per cent ferromanganese, $97.56; 50 per cent ferrosilicon, $85 to $87.50; spiegeleisen, 18 to 22 per cent, $37.76.

Cast Iron Pipe.—After giving definite signs of stiffening in price, cast iron pipe has suffered a setback as the result of keen competition on 600 tons of 6-in. and 8-in. Class B pipe placed this morning by Chicago. The award was made to the United States Cast Iron Pipe & Foundry Co. at $26.40, Birmingham, or $34.60, delivered. Other bids ranged upward to $38.50. A new inquiry of particular note is one from Detroit for 4000 tons of 24-in. Class C, 3700 tons of 8-in. Class B and 1800 tons of 6-in. Class B pipe. Evansville, Ind., has rejected for a second time bids for about 900 tons of 8 to 12-in. Class C pipe. Sellers are having little or no difficulty in obtaining $30, Birmingham, on small tonnages, but because of the unbalanced condition of foundry books it appears to be impossible for prices on large orders to be pulled up. Unusual open weather for this time of year is leading contractors to prolong the pipe-laying season, with the result the orders from them are larger than a year ago at this time. A pickup is noticeable in the number of small purchases, particularly from public utilities. Deliveries are reasonably prompt in all sizes.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $34.70 to $37.20; 4-in., $38.70 to $41.20; Class A and gas pipe, $4 extra.

Bars.—Demand for soft steel bars is improving, and further expansion is looked for by the trade as a result of December schedules now being prepared by automobile manufacturers and accessory makers. In the absence of announcements of first quarter prices, interest in future buying is wholly lacking and new orders, which are a trifle ahead of shipments, are for coverage during the remainder of this year. Alloy steel bars are in small demand, and output does not average over 50 per cent of mill capacity. Orders for iron bars are small and emanate principally from railroads. Rail steel bars are steady at 1.80c. per lb. for orders of 100 tons and at 1.90c. for less than that amount. New buying is equal to production, which is a shade higher than in the first three weeks of November a year ago. Several inquiries have developed for first quarter, and some business has been taken for that period at present price levels. Distributers of fence posts are showing interest in orders for spring delivery. The rail steel bar market is being sustained largely by manufacturers of barn equipment and farm machinery.

Mill prices per lb.: Soft steel bars, 1.90c., base, Chicago; common bar iron, 1.90c., base, Chicago; rail steel bars, 1.80c., base, Chicago.

Reinforcing Bars.—Trends in prices are uncertain. Dealers are trying to relay the mill price advance of $1 a ton to consumers of reinforcing bars, but as yet success has been attained only on small-tonnage lots. Sales made in the week indicate that bars made from billet stock command 2.75c. per lb. in lots of 5 tons or less, while 2.20c. represents the market on large-tonnage orders. Rail steel bars lack firmness at 1.80c. to 1.90c. Pending projects are active and represent a large total, having been swelled by the 2500 tons which will be required in the Campbell Soup Co.'s new plant. New contracts and recent inquiries are shown on page 1557.

Rails and Track Supplies.—Standard-section rails placed this week total 55,000 tons, of which two-thirds were taken by Western mills. Included in this were the requirements of the Omaha lines of the Chicago & North Western. Of 47,000 tons ordered by the Erie, 14,000 tons went to the Illinois Steel Co., 7000 tons to the Bethlehem Steel Co., 2000 tons to the Inland Steel Co. and the remainder to the Carnegie Steel Co. Local producers estimate that fully 250,000 tons is out on inquiry, or will soon be actively in the market. Accessory purchases total 30,000 tons, and 75,000 tons are on inquiry. Rail mill operations have been increased, but there is practically no change in output of track supplies for the reason that deliveries on the latter are not required in proportion to rail shipments at this time of the year. The Missouri Pacific and subsidiary lines are in the market for 60,000 tons of rails. Light rail orders of carlot size are more numerous.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per Lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Sheets.—Orders for sheets are lighter, and producers have had to adjust operations to a 50 per cent of capacity basis. Prices continue soft, and business in blue annealed sheets has been taken at 2.15c., Chicago district mill. In Chicago prices are holding at $2 a

ton above the general level throughout the remainder of the district. Container manufacturers are still taking fair quantities, but as a general thing the trade is giving close attention to keeping inventories as low as possible. There is talk among producers of naming first quarter prices in the next few days.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 2.95c.; No. 24 galvanized, 3.80c.; No. 10 blue annealed, 2.25c. to 2.30c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Plates.—An oil producer in the Southwest has ordered 10,000 tons of plates for oil tank construction, and several similar projects and also an oil pipe line or two are taking definite shape. Wide plate capacity in this district is more than ample to satisfy the demands of users at this time, and deliveries are prompt. The railroad equipment market is quiet, with the one exception that car builders expect orders from the Chicago & North Western before the end of this week. Earlier reports that the Rock Island would buy cars apparently were not well grounded, because no inquiry has as yet come to light. Mills look for no assistance in the way of larger rollings for car orders until after the turn of the year.

Mill prices on plates per lb.: 1.90c., base, Chicago.

Structural Material.—Of particular interest in this market is the announcement that air rights may now legally be sold to the *Daily News* and Marshall Field & Co. Figures have been taken on the *Daily News* Building, which will require 14,000 tons. The Marshall Field warehouse is still in the course of plan making, and estimates of the steel to be required vary from 30,000 to 50,000 tons. Outstanding among awards this week is the Public Safety Building, Milwaukee, which calls for 1700 tons. Figures will soon be taken for an approach to the Robey Street, Chicago, bridge. Estimates place the steel required at 1500 tons. Local producers are holding firmly to 1.90c., Chicago, as the minimum on structural material.

Mill prices on plain material per lb.: 1.90c., base, Chicago.

Wire Products.—Agricultural districts continue to place orders for wire and wire products in sufficient volume as to hold the general level of mill operations at 55 per cent of capacity in spite of a slightly lower demand from the manufacturing trade. Inquiry from several automobile manufacturers gives promise of heavier shipments to that class of users in the next few weeks. Orders for field fencing are more numerous, distributers being more willing to make future commitments than they were when spring terms were first announced. Larger buyers, notably the railroads, are staying out of the market, apparently having already placed orders for the remainder of this year and being unwilling to give consideration to first quarter requirements pending a definite stand on prices by producers. Cold weather in the Northwest has practically put an end to outdoor work in that section, with a resulting lessening in orders for wire and wire products. Users in the Dakotas are still sending in sizable orders, however. As a general thing, wire business is about equal to that of a year ago at this time. Producers anticipate an active spring demand on the grounds that this year's crop will afford the means for undertaking improvements which have been neglected for two or three years. Several producers of nails are naming a price of $2.55, Chicago, but the leading producer is holding at $2.55 to $2.60.

Bolts, Nuts and Rivets.—Specifications are in steady volume. Sellers expect to prepare first quarter contracts in the next week or 10 days.

Coke.—Chicago producers of by-product foundry coke have named $9, local ovens, and $9.50, delivered Chicago switching district, as the contract prices for 1928. For the most part, users show hesitancy in obligating themselves for more than the first half of the year. All ovens are lighted, and shipments are steady, following the drop reported a week ago.

Old Material.—The Chicago scrap market is again experiencing a spell of optimism on the part of dealers. Speculation is more active on railroad lists, and the spread between prices last paid by consumers and those obtained by the railroads has widened. In part this may be due to the expectancy on the part of brokers that cold weather will hamper the delivery of scrap, thereby giving them more time in which to cover. So far as actual sales go, there is little or nothing to indicate that prices will advance more than a nominal amount. Consumption is no higher than it has been for some time past, and there are few consumers who feel that this is a good time to anticipate requirements beyond what has been customary. The consumers' attitude is clearly indicated by offers from two steel producers of $11.50 to $12 per gross ton, delivered, for various grades of heavy melting steel. A slight pickup in demand is noted in wrought scrap. Several small sales have brought 25c. above the level of a week ago, and dealers are being forced to pay higher prices to cover old contracts. Two railroad lists are offered this week, one by the Burlington for 4000 tons and a blank list by the Michigan Central.

Prices delivered consumers' yards, Chicago:

	Per Gross Ton
Basic Open-Hearth Grades:	
Heavy melting steel	$11.50 to $12.00
Shoveling steel	11.50 to 12.00
Frogs, switches and guards, cut apart, and miscellaneous rails	12.75 to 13.25
Hydraulic compressed sheets	10.00 to 10.50
Drop forge flashings	9.00 to 9.50
Forged, cast and rolled steel car-wheels	14.50 to 15.00
Railroad tires, charging box size	14.50 to 15.00
Railroad leaf springs, cut apart	14.50 to 15.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.00 to 13.50
Coil springs	14.75 to 15.25
Low phosphorus punchings	13.00 to 13.50
Electric Furnace Grades:	
Axle turnings	11.50 to 12.00
Blast Furnace Grades:	
Axle turnings	10.00 to 10.50
Cast iron borings	9.50 to 10.00
Short shoveling turnings	9.50 to 10.00
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	13.00 to 13.50
Rerolling rails	13.50 to 14.00
Cupola Grades:	
Steel rails less than 3 ft.	14.50 to 15.00
Angle bars, steel	13.25 to 13.75
Cast iron carwheels	13.25 to 13.75
Malleable Grades:	
Railroad	12.50 to 13.00
Agricultural	12.00 to 12.50
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
	Per Net Ton
Rolling Mill Grades:	
Iron angle and splice bars	13.50 to 14.00
Iron arch bars and transoms	17.75 to 18.25
Iron car axles	20.00 to 20.50
Steel car axles	14.50 to 15.00
No. 1 railroad wrought	9.75 to 10.25
No. 2 railroad wrought	10.25 to 10.75
No. 1 busheling	8.50 to 9.00
No. 2 busheling	4.50 to 5.00
Locomotive tires, smooth	12.50 to 13.00
Pipes and flues	7.00 to 7.50
Cupola Grades:	
No. 1 machinery cast	13.50 to 14.00
No. 1 railroad cast	12.50 to 13.00
No. 1 agricultural cast	12.50 to 13.00
Stove plate	11.75 to 12.25
Grate bars	10.75 to 11.25
Brake shoes	10.00 to 10.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.20c. to 2.65c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb.	$3.20
Common wire nails, base per keg	$2.85 to 2.95
Cement coated nails, base per keg	2.95

New York

Interest Shown in First Quarter Pig Iron —Talk of Higher Sheet Prices

NEW YORK, Nov. 29.—Melters are showing increasing interest in their first quarter pig iron requirements, although in most cases they have not yet issued formal inquiries. The General Electric Co., however, is in the market for 1500 tons for its Lynn and Everett, Mass., plants, and an inquiry for an equal amount has come from another source. The General Electric Co. is also asking for prices on 150 tons of low phosphorus for Schenectady, N. Y. The Worthington Pump & Machinery Corporation, New York, is inquiring for 160 tons of No. 2 plain and No. 2X for prompt shipment to Holyoke, Mass. Sales by local brokers during the week totaled 5500 tons, or slightly less than in the previous week. The American Car & Foundry Co. closed for 1500 tons, consisting of No. 2 plain, No. 2X and malleable, for its Berwick, Pa., plant, and is understood to have placed the entire tonnage with a Buffalo district furnace. The Burnham Boiler Corporation has divided about 2000 tons for its Elizabeth, N. J., and Lancaster, Pa., plants among Buffalo and eastern Pennsylvania furnaces. The price situation remains substantially unchanged, with Buffalo foundry iron ranging from $16.50 to $17, base furnace, and eastern Pennsylvania iron from $18.50 to $19. Silicon differentials are being waived in many instances on Buffalo iron, particularly on the No. 2X grade. The furnace at Port Henry, N. Y., will be put back in blast, according to present plans, about Jan. 1.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail)	$21.41 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	19.89 to 21.52
East. Pa. No. 2 fdy., sil. 2.25 to 2.75	20.39 to 22.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	20.89 to 22.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Ferroalloys.—New business in ferroalloys and spiegeleisen is naturally confined to carload and small lots, but the volume is small. So far as can be learned, no movement has yet been started as to prices for 1928 and there is very little inquiry for next year's needs. An advance in the price of ferromanganese would not be a surprise and is in fact generally looked for. Specifications on contracts for ferromanganese and other alloys are fairly satisfactory and better than a few months ago.

Reinforcing Bars.—No large jobs have been reported closed in this district during the past week, and there have been few additions to the list of pending work. However, about 7500 tons is involved in large projects alone which will probably be placed before the first of the year. A Philadelphia contractor has been awarded the general contract on a highway viaduct at Newark, N. J., which will require about 800 tons. The ruling mill price is unchanged at 1.85c., Pittsburgh, and the Youngstown warehouse price is still 2.20c., or 2.57½c., on cars at New York. Distributers are quoting 2.80c. per lb. for lots of 5 tons or more, delivered at job out of New York warehouse; 2.95c. for lots of 2 to 5 tons, and 3.24c. for less than 2 tons.

Cast Iron Pipe.—Inquiry is smaller than in previous weeks, but there is a sizable tonnage of pending business, almost entirely from privately owned companies. One recent private purchase of gas pipe totaled close to 25,000 tons and is understood to have gone to the leading pipe interest. On bids opened today by New York on a contract involving about 1900 tons of 20-in. water pipe the Norton Construction Corporation, New York, was low. Pressure pipe prices are slightly firmer, but where future deliveries are not specified and the tonnage is desirable less than $28 per ton, base Birmingham, is still obtainable.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $36.25 to $37.25; 4-in. and 5-in., $41.25 to $42.25; 3-in., $51.25 to $52.25; Class A and gas pipe, $4 to $5 extra.

Finished Steel.—In an effort to establish more profitable selling prices on first quarter business, some of the sheet mills will probably announce an advance in prices this week or next. The new price on black sheets is expected to be 2.90c., while galvanized may be put up $2 to 3.75c., Pittsburgh. Blue annealed sheets may be left at 2.10c., but a new card will be issued shortly establishing extras on widths greater than 40 in., thus differentiating between those sizes which are rolled by continuous mills and those which are not. In anticipation of a rise in prices, buyers of sheets have been somewhat more liberal in the placing of orders within the past week, but mills have refrained from

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.30c.
Flats and squares	3.80c.
Cold-rolled strip, soft and quarter hard,	6.00c. to 6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage),	3.84c. to 3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 *x* 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 *x* 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.90c. to 4.00c.
No. 22	4.05c. to 4.15c.
No. 24	4.10c. to 4.20c.
No. 26	4.20c. to 4.30c.
No. 28*	4.35c. to 4.45c.
No. 30	4.60c. to 4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c.
No. 16	4.45c.
No. 18	4.50c. to 4.60c.
No. 20	4.65c. to 4.75c.
No. 22	4.70c. to 4.80c.
No. 24	4.85c. to 4.95c.
No. 26	5.10c. to 5.20c.
No. 28*	5.35c. to 5.45c.
No. 30	5.75c. to 5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

making contracts beyond Jan. 1. Progress is being made in the putting into effect of the recent advance of $1 a ton on plates, shapes and bars, and some buyers have paid the new quotation during the past week. However, most of the current specifications are at the old prices and this condition will continue to a large extent until the end of the year. Plates are still to be had at 1.75c., Pittsburgh, but bars and shapes are more firmly established at 1.80c. on new business. A few first quarter contracts for bars at 1.80c., Pittsburgh, have been written. Structural steel tonnage is considerably lighter, but to offset this prospects appear somewhat brighter for purchases of cars by the railroads. The Baltimore & Ohio is expected to come into the market soon for 2000 steel car bodies and possibly 2000 70-ton hopper cars.

Mill prices per lb., delivered New York: Soft steel bars, 2.14c.; plates, 2.14c.; structural shapes, 2.14c.; bar iron, 2.14c.

Warehouse Business.—The past month has compared favorably with October, and purchases, although small in tonnage, have been fairly numerous. The sheet market continues to be shaded 5c. to 10c. per 100 lb., particularly on galvanized. Demand for structural material is lighter, and on business where competition from material of European origin is encountered concessions appear.

Old Material.—Prices show no change, and No. 1 heavy melting steel is still being purchased by brokers at $13.50 per ton, delivered eastern Pennsylvania, although one large consumer recently purchased a tonnage at $13.50 per ton, delivered, which would justify buying offers of 50c. per ton less. Mixed borings and turnings continue to be purchased at $9.50 to $10 per ton, delivered, with shipments going to consumers at Bethlehem and Swedeland, Pa. Machine shop turnings are moderately active at $10.50 per ton, delivered. Other grades are unchanged in price and generally inactive.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	6.25 to 6.75
No. 1 heavy breakable cast	11.25 to 12.00
Stove plate (steel works)	8.25 to 8.50
Locomotive grate bars	8.25 to 8.50
Machine shop turnings	6.00 to 7.00
Short shoveling turnings	7.00 to 7.50
Cast borings (blast furnace or steel works)	6.75 to 7.25
Mixed borings and turnings	6.00 to 7.50
Steel car axles	15.75 to 16.25
Iron car axles	23.25 to 23.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.75
Forge fire	6.50 to 7.00
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought, long	9.00 to 9.50
Rails for rolling	10.00 to 10.50
Cast iron carwheels	11.25 to 11.75
Stove plate (foundry)	8.75 to 9.25
Malleable cast (railroad)	10.00 to 10.50
Cast borings (chemical)	11.50 to 12.00

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$13.50 to $14.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	11.50 to 12.00
No. 2 cast (radiators, cast boilers, etc.)	11.00 to 11.50

Coke.—Two New England producers of by-product foundry coke have opened their books for the first half of next year, and the local coke operation is expected to follow in a few days. Prompt shipment beehive foundry coke continues at $4 to $4.25 per net ton, Connellsville, and furnace grade at about $3, Connellsville, with $2.75 per ton still possible on a sizable purchase. Delivered prices on Connellsville foundry coke are: To northern New Jersey, $8.03 to $8.28; to New York or Brooklyn, $8.79 to $9.04; to Newark or Jersey City, N. J., $7.91 to $8.16. By-product foundry coke ranges from $9.45 to $9.85 per net ton, delivered Newark or Jersey City.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.50c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb.	$2.90
No. 9 galvanized wire, per 100 lb.	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

Cleveland

November Steel Bookings Show Gain Over October—Ford Buys Sheets

CLEVELAND, Nov. 29.—Mills are getting a fair volume of specifications for steel bars, plates and structural material against orders placed at 1.75c. before the price advance, and some small-lot business is coming out at the current price of 1.80c. As a result of the spurt caused by marking up prices, the November volume of business in this territory will show some gain over October. Mills are adhering to the base of 1.80c., but efforts to get 1.90c. for less-than-carload lots are only partly successful.

Considerable increase in production by automobile plants in December is expected, according to representatives from Detroit. However, automobile manufacturers outside of the Ford Motor Co. are not ordering steel in larger lots than recently. The expectation of more activity in the automotive field seems to be based largely on the removal of uncertainty about the new Ford car, which will be placed on display this week. The delay in the appearance of the Ford car has been blamed for the slowing down of the automotive industry for the past few months. It is reported that the Chevrolet Motor Co. is about to start production in a large way on its own new model.

The Ford company purchased 5000 tons of sheets of various grades during the week and released fair specifications on some sheet tonnage previously bought. It will be several weeks, it is expected, before the Ford company gets into operation on a good production schedule, and not a great deal of tonnage is looked for from this company before January. Some of the manufacturers of automobile parts in this territory are getting busier. In the structural field a moderate volume of new work is coming out. While weakness on nails has developed in some sections, a price of $2.50 is being maintained in this market.

Iron Ore.—The Lake shipping season closed Nov. 20 with the dispatch of the last cargo from the head of the Lakes. The movement by water for the month was 2,000,422 tons, and for the season, 51,107,136 tons. More detailed figures on the season's shipments are found in another column.

Pig Iron.—Sales increased in the past week, during which Cleveland interests sold 38,000 tons of foundry and malleable iron. A local interest took a considerable portion of 26,000 tons placed by the Standard Sanitary Mfg. Co. for its Pittsburgh and New Britain plants. This went at $17.25, Valley furnace, or 25c. below the recently ruling Valley quotation. Outside of this business, sales have been confined largely to western Ohio and Indiana. The market is dull in Michigan, where a first quarter buying movement has not yet developed. An increase in operations is expected in December by some of the Michigan automobile foundries, but these still have considerable iron due on contracts and are expected to await developments in the automotive field before making purchases, with the possibility that they may not come in the market before January. November sales by one producer exceeded those of any previous month since August. November shipments will total about the same as during October. Inquiries are pending for 10,000 tons or more. Some foundries want to buy for the first half, but producers generally are declining to sell beyond the first quarter. While prices are unchanged, some producers are showing a disposition to take a firmer stand, at least to the extent of not waiving silicon differentials. Although there is a wide range of prices, depending on location of buyers, Lake furnaces claim to be holding to a minimum of $16.50 for foundry and malleable iron. For delivery to some points $17, furnace, and higher prevails. The price

for Cleveland and also for Michigan delivery is $18, furnace.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.50
Southern fdy., sil. 1.75 to 2.25	22.00
Malleable	18.50
Ohio silvery, 8 per cent	28.00
Basic, Valley furnace	17.00
Standard low phos., Valley furnace	27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—There is very little business in specifications against contracts or in new orders. While $34, Cleveland, is the common quotation, some mills are able to buy sheet bars at $33. Wire rods are holding to $40, Cleveland.

Sheets.—The most important change in the price situation in sheets is a reduction of $3 a ton to 4c., Pittsburgh, on automobile body sheets. Weakness recently developed in the Detroit territory, where some business was taken at 4c., Pittsburgh, and it is reported that this has been shaded to 3.95c. Some of the mills are still asking 4.15c. for small lots. Blue annealed sheets are weaker, now being represented by a range of 2c. to 2.10c., although some business is reported to have been taken in Cleveland at as low as 1.90c. Black sheets range from 2.75c. to 2.80c., Pittsburgh, and galvanized sheets are unchanged at 3.65c., Pittsburgh or Ohio mill. Demand shows little, if any, improvement. Some business has been taken for January shipment, but mills are not inclined to name the present minimum prices except for early delivery.

Strip Steel.—Hot-rolled strip continues weak and irregular, and with the present condition of the market the established widths for price ranges are being rather generally disregarded and prices are being rather commonly based on the more general terms of wide or narrow material. On strip 6 in. and wider 1.85c. to 1.90c. is being quoted, but for material wider than 12 in. a price of 1.75c. is appearing. On narrower than 6 in. a price of 2c. is being named. Hoops and bands have been sold for the first quarter at 2.25c. Cold-rolled strip has become well stabilized at 3c. per lb., Cleveland, for 1 to 3 tons, with 2.75c. ruling for 3 tons or more. The volume of business in both hot and cold-rolled strip is rather light.

Reinforcing Bars.—The Hunkin-Conkey Construction Co., Cleveland, has taken a contract for the Arlington Memorial Bridge, Washington, requiring 3000 tons of reinforcing bars. Several other jobs requiring fair-sized tonnages are pending. Rail steel bars are unchanged at 1.65c. to 1.70c., mill, but the lower price might be shaded on round lots.

Warehouse Business.—Sales during November barely held up to those in October. Prices are holding well. Jobbers are not disposed to shade sheets in spite of the weakness of mill prices.

Coke.—Foundry grades of coke are moving very slowly. While Connellsville coke is available at $3.75, ovens, the usual range on standard brands is $4.25 to $4.50. Foundry heating coke ranges from $2.75 to $3, ovens. Warm weather is affecting the demand for by-product coke for domestic use, and producers are having difficulty in finding a market for this grade.

Bolts, Nuts and Rivets.—The demand for bolts and nuts continues slow, and business taken by some of the manufacturers during November will fall slightly below that of October. The industry is operating at about 50 per cent of capacity. Rivet orders have picked up slightly. Practically all consumers have contracts and are getting shipments at $2.75 for large rivets.

Old Material.—A somewhat better feeling has developed among dealers, but the demand for scrap has not improved and prices are no firmer. A Valley district mill has purchased 500 tons of No. 1 busheling from a Cleveland dealer at $14. Local dealers continue to buy heavy melting steel in small lots for a Cleveland mill, paying $13.50 for No. 1 grade and $13 for No. 2. Mills are still regulating shipments and are taking no more scrap than recently. December scrap lists from the Michigan automotive industry are expected to be rather light. The list of the Buick Motor Co. is out and contains 3500 tons of various grades.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades		
No. 1 heavy melting steel		$13.50
No. 2 heavy melting steel		13.00
Compressed sheet steel	$12.50 to	12.75
Light bundled sheet stampings	11.00 to	11.50
Drop forge flashings	12.00 to	12.50
Machine shop turnings	9.00 to	9.25
No. 1 railroad wrought	11.50 to	12.00
No. 2 railroad wrought	13.50 to	13.75
No. 1 busheling	11.50 to	11.75
Pipes and flues	9.00 to	9.50
Steel axle turnings	12.50 to	13.00
Acid Open-Hearth Grades		
Low phosphorus forging crops	16.50 to	17.00
Low phosphorus, billet, bloom and slab crops	17.00 to	17.50
Low phosphorus sheet bar crops	16.50 to	17.00
Low phosphorus plate scrap	16.00 to	16.50
Blast Furnace Grades		
Cast iron borings	10.50 to	10.75
Mixed borings and short turnings	10.50 to	10.75
No. 2 busheling	10.50 to	10.75
Cupola Grades		
No. 1 cast	16.00 to	16.50
Railroad grate bars	11.00 to	12.00
Stove plate	12.00 to	12.50
Rails under 3 ft.	18.00 to	18.50
Miscellaneous		
Railroad malleable	15.00 to	15.50
Rails for rolling	16.25 to	16.50

Philadelphia

Specifications Increase on Fourth Quarter Steel Contracts

PHILADELPHIA, Nov. 29.—With no apparent increase in the consumption of finished steel products, there has been an upward trend in the volume of specifications against fourth quarter contracts, not only for plates, shapes and bars, on which an advance of $1 a ton was recently announced, but also for sheets, which consumers have been told may be put on a higher price basis shortly. Incoming specifications are, of course, against contracts which, in the case of plates, shapes and bars, were written at lower than today's quotation of 1.80c., Pittsburgh. There is evidence that some of the orders are for stock, since the size of many of them is larger than the recent average.

The price situation is still working itself out. As yet the 1.80c. quotation on plates, shapes and bars has been operative on only a small volume of business, considering that nearly all regular buyers are covered at former prices until the end of the year; while in sheets the reports of imminent price advances are at odds with the low prices quoted for current specifications. Hot and cold-rolled strip steel continue to show weakness, while wire nails have practically settled to $2.45 per 100 lb. keg, base.

A low average rate of foundry operations is drying up sources of pig iron business. There is little demand

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, ⅜-in.	2.80c. to 3.00c.
Structural shapes	2.50c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.50c. to 2.60c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.25c. to 5.25c.
Cold-finished steel, squares and flats	3.75c. to 5.75c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅜-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.25c. to 4.35c.
Galvanized sheets (No. 24)	5.10c. to 5.20c.
Blue annealed sheets (No. 10)	3.20c. to 3.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

for first quarter iron. While signs of an advance in scrap prices are lacking, there is a stronger undertone, due largely to expectations of improving business in the first quarter of the new year.

Pig Iron.—While some offices sold slightly more iron in the past week than in the week before, the pig iron market as a whole is close to the point of stagnation, and the dullness of the foundry industry in this section gives little hope for an early increase in consumption. Consumers are taking little interest in contracts for first quarter. Foundry iron is being sold at $19 to $19.50, base, eastern Pennsylvania furnace, while New York State iron coming into this territory is usually sold at $16.50 to $17, Buffalo. It develops that recent large sales of basic pig iron were at $19, delivered, but a sale within the past week of a few thousand tons at $19.50 establishes a range on this grade of $19 to $19.50.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$19.76 to $20.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.26 to 20.76
East. Pa. No. 1X	20.76 to 21.26
Basic (delivered eastern Pa.)	19.00 to 19.50
Gray forge	19.50 to 20.00
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	25.29 to 25.54
Virginia No. 2X, 2.25 to 2.75 sil.	25.79 to 26.04

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Ferromanganese.—Eastern producers of ferromanganese are expected to announce shortly, perhaps this week, the price to apply on first half contracts, and it is probable that there will be an advance to $95 or $100, furnace. English producers may follow, as usual, the American prices.

Plates.—Sales of plates have been slightly larger in November than in October, but are not sufficient to make any change in the rate of operation at Eastern mills, which is still low, probably not above 50 per cent. Some mills have notified customers that all fourth quarter tonnage must be specified before the end of December and that any not specified will be cancelled; so, in view of the higher price prevailing on new business, it is expected that specifications will continue at about the present rate during the next month.

Structural Material.—Tonnage projects are scarce, but there is a fair number of small jobs. Specifications against contracts entered before the advance in price to 1.80c., Pittsburgh, are being sent to the mills more freely. November bookings will probably exceed those of October, but the increase will not be large. The largest awards of the week were 2300 tons for New Jersey highway work to the Phoenix Bridge Co. and 1700 tons for a theater in Philadelphia to the Belmont Iron Works.

Bars.—Specifications for steel bars have been somewhat better in the past week, bringing the November volume up to that of October, and in some cases slightly ahead of October. A few first quarter contracts have been made at 1.80c., Pittsburgh, but generally both buyers and sellers are in no hurry to make contracts.

Sheets.—Reports of a probable advance in sheet prices are not fully verified, but one or two mills are said to have gone to 2.90c., Pittsburgh, on black sheets. Galvanized sheets may be put at 3.75c., while the new blue annealed price may be 2.20c. Meanwhile, black sheets are being sold at 2.75c., galvanized at 3.65c. and blue annealed at 2.10c. A new card establishing extras on blue annealed sheets wider than 40 in. may also go into effect soon.

Imports.—Last week's pig iron imports at Philadelphia amounted to 2032 tons, of which 2002 tons came from India and the rest from England. Steel imports were 718 tons, of which 593 tons was shapes from Belgium; 44 tons of shapes came from France and 81 tons of bars from Belgium.

Old Material.—Scrap prices stand practically where they were a week ago; yet the market presents a slightly firmer undertone due to several factors. One is the high rate at which steel scrap is being consumed, some mills using more than the customary 50 per cent; another is the reduced rate of production due to curtailed industrial activity; still another reason is the more exacting requirements of mills, which are scraping the market bare of the better grades of heavy melting stock, while leaving a surplus of secondary grades. An improved tone at Pittsburgh, together with the considerations above mentioned, have to some extent changed recent pessimism among brokers and dealers to optimism. A nearby mill bought a tonnage within the week at $14, and, while sales the week before were at $13.50, it is doubted in the trade that the latter price could be duplicated. Foundry grades are not in much demand because of the reduced rate of foundry operations.

Prices per gross ton delivered consumers' yards' Philadelphia district:

No. 1 heavy melting steel	$13.50 to $14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.00
No. 1 railroad wrought	15.25 to 15.75
Bundled sheets (for steel works)	10.00 to 10.50
Machine shop turnings (for steel works)	10.50 to 11.00
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for steel works and rolling mill)	11.00 to 11.25
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	12.50
Stove plate (for steel works)	12.50
No. 1 low phos., heavy, 0.04 per cent and under	18.00 to 18.50
Couplers and knuckles	16.00
Rolled steel wheels	15.50 to 16.00
No. 1 blast furnace scrap	10.00 to 10.50
Machine shop turnings (for rolling mill)	11.00 to 11.50
Wrought iron and soft steel pipes and tubes (new specifications)	11.50 to 12.00
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00
Steel rails for rolling	15.00 to 15.50
Cast iron carwheels	15.50
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	15.00 to 15.50

Youngstown Company Arranges for Refinancing and Improvements

The Youngstown Sheet & Tube Co. has completed refinancing plans, whereby directors have authorized refunding mortgage bonds paying 5 per cent, totaling $175,000,000, of which $75,000,000 will be issued Jan. 1, 1928. Proceeds of this issue will be used to retire all current issues against the parent company and subsidiaries, and provide capital for completion of improvements under way and contemplated. These include motorization of the Campbell plant; building a by-product coke oven battery at South Chicago, and construction at a cost of $800,000 of two sintering plants, one for the Youngstown district and the other for Chicago.

To Consider Standardization of Speeds of Driven Machines

A general conference on speeds of driven machines will be held in the board room of the American Engineering Standards Committee, Engineering Societies Building, 29 West Thirty-ninth Street, New York, on Dec. 9, at 10 a. m.

The purpose of the conference is to determine in a general way whether there shall be set up a national system of standard speeds for driven machinery. It is being called in connection with a request received by the A. E. S. C. from the National Electrical Manufacturers Association. If industries concerned in the matter consider this standardization desirable, the scope and method of organization of the work will be taken up.

Exports of textile machinery to the United States from Saxony, Germany, declined from $961,726 to $833,206 during the third quarter of 1927, compared with the corresponding quarter of last year, according to a report from Consul George P. Waller, Dresden. American purchases of other machinery, however, increased to $201,009 from $105,829.

San Francisco

Cast Pipe Active, Steel and Pig Iron Quiet—Good Building Outlook

SAN FRANCISCO, Nov. 26 (*By Air Mail*).—While little improvement is noted in demand for iron and steel products on the Coast this week, sentiment is better, due to the advance of $1 a ton on bars, shapes and plates in many of the large Eastern centers of consumption. As yet, this advance is not reflected in the Western markets, 2.40c., c.i.f., continuing to apply to both plates and shapes. Fabricating awards this week all involved lots of less than 500 tons, the largest letting calling for 300 tons for a bridge at Cranbrook, B. C. The cast iron pipe market was the most active one of the week, and while no large tonnages were placed, Glendale and Burlingame, Cal., have come into the market for 952 and 835 tons of pipe respectively.

Building permits issued in Los Angeles up to the 15th of the month numbered 1848, with an estimated valuation of $13,961,206, as compared with a total of $5,882,754 for the same period last month and $4,996,510 for the corresponding period of November, 1926.

Pig Iron.—Interest in new buying is lacking, and current sales and inquiries call for small lots. Over 1000 tons arrived on the Coast last week and has been delivered, approximately 500 tons being for foundries in the southern part of the State and the remainder for Bay district plants. All of this material was applied against contracts placed some time ago. Prices remain unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Bookings of structural shapes were by no means heavy and involved only three projects of 100 tons or over. The largest letting, as reported above, was for the Kootenay River bridge. The Michel & Pfeffer Iron Works will fabricate 200 tons of Coast steel for a plant for itself, and the Central Iron Works took 110 tons for an apartment on Pacific Street, San Francisco. No new inquiries developed during the week, but several fair-sized projects are expected to be let within the next week or so. No action has yet been taken on the 2100-ton inquiry of the Simpson Logging Co., Seattle, Wash., for two bridges. This is the largest inquiry up for figures at the moment, although approximately 5000 tons will be required in the new Capwell Department Store at Oakland, preliminary plans on which are now being prepared. Plain material continues firm at 2.40c., c.i.f. Coast ports.

Plates.—Demand for plates is almost at a standstill, only one project of size being in the market for figures. This is a pipe line at Ventura, Cal., on which alternate bids are being taken for cast iron pipe. Several large pipe line projects are about ready for figures, but it is doubtful whether the specifications will be out this year. Plate prices continue to command 2.40c., c.i.f.

Bars.—The bulk of the concrete bar business being booked at present is limited to small lots, ranging from 10 to 30 and 40 tons. The largest award reported called for 100 tons for a plant in San Francisco and was secured by an unnamed San Francisco jobber. No action has yet been taken on the 8500-ton inquiry for the Coyote Point bridge over San Francisco Bay. New inquiries include 160 tons for Los Angeles County, bids on which open next week. Mild steel bars are moving in small lots only, and local producers are confronted with the problem of meeting stiff foreign competition. As a result of this situation, the mill price has gradually been reduced and is now only about $5 a ton higher than the foreign quotations.

Cast Iron Pipe.—Bookings have been light, only one letting of over 100 tons being reported. This called for 198 tons of 4 to 8-in. Class B pipe for the improvement of Golf Drive, San Diego, Cal., booked by Stroud Brothers & Seabrook. Several inquiries developed during the week in which fair tonnages are specified. Bids are being taken by Burlingame, Cal., for 835 tons of 2 to 12-in. Class B pipe, and Glendale, Cal., will open bids on Dec. 1 for 952 tons of 4 to 12-in. Classes B and C pipe. San Diego, Cal., will take bids on Dec. 7 for 135 tons of 6-in. Class B pipe for the improvement of Winona Avenue. Bids open next week on 1080 tons of 6 to 12-in. Class B pipe for the improvement of Market Street, San Diego, and on 491 tons of 4 and 8-in. Class B for Santa Ana, Cal. Prices are slightly stronger, and $36 a ton, delivered, on 6-in. and larger is now general.

Steel Pipe.—Due to the exceptionally quiet condition existing in the oil fields in the southern part of the State, demand for oil country goods is practically dormant. Movement of standard steel pipe is considered only fair for this time of the year. Ventura, Cal., will open bids next week on 295 tons of 3-in. standard pipe. This is the only large inquiry before the trade at present.

Rails.—Action has been deferred until next week on the inquiry for 500 tons of 60-lb. and 50 tons of 80-lb. T-rails and 600 tons of 80 to 127-lb. girder rails for the Seattle municipal railroad.

Coke.—The same quiet condition noted in the pig iron market also applies to the coke market, and both sales and inquiries are limited to small lots.

Coke prices per net ton at incoming dock: English beehive coke, $16 to $16.50; English by-product, $12.50 to $13.50.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ¼-in. and over	3.15c.
Small angles, under ¼-in	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.75c.
Galvanized sheets (No. 24)	5.35c.
Structural rivets, ½-in. and larger	5.65c.
Common wire nails, base per keg	$3.35
Cement coated nails, 100-lb. keg	3.35

Birmingham

Pig Iron Buying Movement Subsides—Open-Hearth Operations Decline

BIRMINGHAM, Nov. 29.—There was little activity in the pig iron market last week, as purchases in the first three weeks in November covered practically all immediate requirements and most of the expected melt in December. Small orders continue to come in from day to day, but the major buying for the remainder of the year is over. No accurate figures are available, but it is estimated that in excess of 150,000 tons was booked in the recent buying movement. The ruling price remains at $16, base Birmingham, for December deliveries. Birmingham furnaces have not yet opened their books for first quarter, nor have they announced their quotation for that period. In some quarters it is expected that a definite move will be made either this week or next. Shipments have speeded up and are equal to the current make. There were no changes last week in furnace operations, 18 being in blast. Of this number nine are on foundry, eight on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$16.00
No. 1 foundry, 2.25 to 2.75 sil.	16.50
Basic	16.00

Finished Steel.—Demand is carrying forward the improvement shown in the preceding weeks of November. Mill prices are unchanged. There has been a slight recession in open-hearth operations. The Tennessee Coal, Iron & Railroad Co. had an average of six active furnaces at the Ensley Works last week and four at the Fairfield Works, a total of 10, as compared with 11 and 12 during most of November. The Gulf States Steel Co. closed down one open-hearth furnace and is now operating four. Structural steel

fabricators and bar manufacturers report a number of small orders. The Ingalls Iron Works Co. has received an award for a new limestone finishing plant at Rockwood, Ala., amounting to 600 tons. The prospect for new business in the structural steel line is said to be good.

Cast Iron Pipe.—New business continues to consist of small orders. Plants are busy on contracts that are to be completed in December. Shipments are at a fair rate. There is an increasing number of inquiries for first quarter tonnage, and Birmingham plans anticipate a good volume of buying for that delivery.

Coke.—Foundry coke for both December and first quarter is being quoted at $5 per net ton, Birmingham. Some contracts have already been placed. Shipments show a slight increase. Buying has also been somewhat better.

Old Material.—The outlook is improving, although the increase in buying has been only slight. Prices remain unchanged.

Price per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$10.00 to $10.50
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Stove plate	13.00 to 14.00
Steel axles	19.00 to 20.00
Iron axles	18.00 to 20.00
No. 1 railroad wrought	10.00 to 11.00
Rails for rolling	12.00 to 13.00
No. 1 cast	14.50 to 15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.50 to 14.00

St. Louis

Heavy Sales of Pig Iron—New Business in Steel Is Light

ST. LOUIS, Nov. 29.—The pig iron market shows a marked increase in activity, with the sale of 9000 tons by a leading Southern interest and 6500 tons by the Granite City maker. The latter included a part of the 5000 tons placed by the Standard Sanitary Mfg. Co. for its Louisville, Ky., plant. The sales reported were for shipment during the remainder of the year. The interest in iron for prompt shipment seems to indicate that melters believe the market has reached bottom. Makers are declining business for first quarter at present prices. Shipping specifications in hand are very satisfactory, and the outlook is that November deliveries will be considerably in excess of shipments in the last few months. The only inquiry of note is for 5000 tons, which is expected to be closed this week.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	20.66
Southern No. 2 fdy., delivered	20.42
Northern malleable, delivered	20.66
Northern basic, delivered	20.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—The market for coke is quiet. The weather has been too warm, cutting the sale of domestic grades, and dealers are not buying from ovens. The demand for industrial grades is slow.

Finished Steel.—Specifications against contracts are reaching the mills in satisfactory volume. New business, however, is light. Some business is being tendered the mills for first quarter shipment at present prices, but is being declined. Warehouse bookings for November are expected to be slightly under those of last month and considerably smaller than in November, 1926. Business is exceedingly dull with fabricators of structural steel.

Old Material.—There is hardly any buying by consumers, and dealers are purchasing only such material as is needed to fill contracts. Country dealers complain that prices are too low, and are shipping very little scrap outside of distress material. Railroad lists, which are unusually heavy, include: Santa Fe Lines, 10,000 tons; Chicago, Milwaukee & St. Paul, 8800 tons; Chicago, Burlington & Quincy, 4850 tons; Great Northern, 4500 tons; Missouri Pacific, 4525 tons and 15 cars of rails; Big Four lines and Union Pacific, 2800 tons each; Nickel Plate, 1000 tons and 10 cars of rails; St. Louis Southwestern, 500 tons; Mobile & Ohio, 26 cars, and St. Louis-San Francisco, 15 cars. No improvement in prices is expected until after the first of the year.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$10.75 to $11.00
No. 1 locomotive tires	13.00 to 13.50
Heavy shoveling steel	10.75 to 11.00
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	12.75 to 13.00
Railroad springs	12.75 to 13.00
Bundled sheets	8.00 to 8.50
No. 2 railroad wrought	10.75 to 11.00
No. 1 busheling	9.50 to 10.00
Cast iron borings	8.75 to 9.00
Iron rails	12.50 to 13.00
Rails for rolling	13.50 to 14.00
Machine shop turnings	6.00 to 6.50
Steel car axles	18.25 to 18.75
Iron car axles	22.50 to 23.00
Wrought iron bars and transoms	19.50 to 20.00
No. 1 railroad wrought	10.00 to 10.50
Steel rails, less than 3 ft	14.50 to 15.00
Steel angle bars	10.75 to 11.25
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	14.50 to 15.00
Railroad malleable	11.00 to 11.50
No. 1 railroad cast	13.00 to 13.50
Agricultural malleable	11.50 to 12.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.80c.
Galvanized sheets (No. 24)	5.35c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
	Per Cent Off List
Tank rivets, $\frac{7}{8}$-in. and smaller	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped	60
Hot-pressed nuts, hexagon, blank or tapped	60

Boston

Mystic Furnace Makes Heavy Shipments—Boston & Albany Buys Rails

BOSTON, Nov. 29.—Although New England foundries evince more interest in 1928 iron, sales in the past week were even smaller than those for the previous week. The Mystic Iron Works sold 1250 tons, half for 1927 and half for 1928 shipment, while the combined sales of all other furnaces did not exceed that amount. The largest individual transaction reported was the sale of 300 tons of No. 1X Mystic iron to a New Hampshire foundry at $20.25 a ton, furnace. The Mystic company's November shipments will aggregate 17,000 tons, the largest for any month in the furnace's history. A large percentage of these shipments comprises low

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

silicon iron for pipe makers located outside of New England. The largest open inquiries remaining uncovered are 500 tons, half No. 2X and half No. 1X, and 300 tons of No. 2 plain, wanted by two Connecticut foundries for 1927 delivery. Most current bookings are the result of solicitation. Prices on all irons, in the absence of attractive business, remain as a week ago. Buffalo foundry iron holds at $17, furnace, despite reports of lower prices in other territories. One stack, however, is waiving the silicon differential on No. 2X, quoting $17, furnace, for that grade and for No. 2 plain, and $17.50 for No. 1X. The recent report that the Troy, N. Y., stack had shipped all its No. 1X iron is without foundation. That furnace advises that it has plenty of No. 1X to take care of its existing contracts, as well as new contracts that may be written pending the resumption of operations.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$21.91
Buffalo, sil. 2.25 to 2.75	$21.91 to 22.41
East. Penn., sil. 1.75 to 2.25	22.65 to 23.15
East. Penn., sil. 2.25 to 2.75	23.15 to 23.65
Virginia, sil. 1.75 to 2.25	25.96 to 26.21
Virginia, sil. 2.25 to 2.75	26.46 to 26.71
Alabama, sil. 1.75 to 2.25	22.91 to 24.77
Alabama, sil. 2.25 to 2.75	23.41 to 25.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Coke.—Both the New England Coal & Coke Co. and the Providence Gas Co. have no intention of changing their prices for by-product foundry coke for December delivery. Quotations will remain at $12 a ton, delivered within a $3.10 freight rate zone. Although the books of these ovens for first half contracts have been opened for but three working days, 75 per cent of their regular customers have covered their requirements. In the closing days of November, shipments from New England ovens slowed up somewhat. The supposition is that those foundries that intended to stock up for the winter have done so. Indications are that the consumption of coke in this territory during December will be smaller than in November, as the melt of iron is decreasing rather than increasing.

Shapes, Plates and Bars.—There is a temporary lull in fabricating inquiries, as well as in bookings; yet fabricators are quite busy for this time of the year on prospects that developed earlier in the month. Local mill representatives have informed fabricators that all tonnages of standard shapes and plates under negotiation must be closed at once and that all new bookings will be on a basis of 1.80c. per lb., base Pittsburgh; consequently steel makers are securing larger bookings. There is a better demand for bars at 1.80c. for large tonnages and at 1.90c. for small, according to the steel mills.

Track Supplies.—The Boston & Albany Railroad has bought 6500 tons of rails for January and February delivery from the Bethlehem Steel Co. and has an option until March 1 on 2500 tons additional. The road has also placed 7000 kegs of track spikes, 395,440 tie plates, 265,000 crossties and 1,175,568 ft. of switch timber.

Warehouse Business.—The movement of iron and steel out of warehouse stocks is gathering momentum, and today is more active than it has been in months. Prices are unsettled. Sales of miscellaneous material in as small lots as 5 tons have been made at 2.70c. per lb., contrasted with regular listed prices ranging from 3.265c. to 3.365c. On reinforcing bars, listed at 2.70c. per lb., base warehouse, there have been concessions of $1 a ton or more.

Cast Iron Pipe.—Providence, R. I., has made no award of 1000 tons of 4-in. to 12-in. pipe, bids for which closed Nov. 23. Competition for this business was keen, with Southern pipe makers the low bidders. Bangor, Me., has set no date for bids to close on 200 tons of 6-in. and 8-in. pipe, and so far as can be ascertained, Portland, Me., has made no award on 300 tons of 8-in. pipe, bids for which closed some days back. New England utility companies, which have been sounding out the market for 1928 requirements, have yet to place orders for several thousand tons. Private pipe business continues in good volume, with 6-in. to 12-in. diameters going at $42.10 to $43.10 a ton, delivered common Boston freight rate points. The market for larger pipe is weak, with concessions of $1 a ton or more being made by foundries.

Old Material.—Despite a more hopeful feeling among the trade as a result of developments in the Pittsburgh district, weak spots continue to crop up in the old material market. For instance, the best price reported paid for No. 1 railroad wrought in the past few days is $10 a ton on cars, shipping point, or $1 a ton less than a week ago, and dealers have lowered bids on axles 50c. a ton. Otherwise prices remain about as heretofore, with the volume of passing business somewhat less. Recent sales included No. 1 yard wrought at $10 on cars, shipping point, or $12 to $12.50, delivered New England consuming point, this price being somewhat higher than that for material going outside New England. Textile and No. 1 machinery cast are selling more freely, with $14.50 a ton, delivered, the prevailing price, although some extra choice car lots have brought $15.50. The Mystic Iron Works has dropped its price on sheared pipe from $9.50 to $9 a ton, delivered. An auction sale of 2,956,000 lb. of ferrous metals, 81,000 lb. of non-ferrous metals, 116,700 lb. of chain cable, 106,000 lb. of boiler tubes, 17 winches, machines and tools of various kinds, pumps, engines and miscellaneous equipment at the Navy Yard, Boston, will close late this afternoon.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.50 to $9.00
Scrap rails	8.50 to 8.75
No. 1 railroad wrought	9.50 to 10.00
No. 1 yard wrought	8.50 to 9.00
Machine shop turnings	5.50 to 6.00
Cast iron borings (steel works and rolling mill)	6.00 to 6.50
Bundled skeleton, long	5.00 to 5.60
Forge flashings	5.50 to 6.00
Blast furnace borings and turnings	5.50 to 6.00
Forge scrap	5.75 to 6.00
Shafting	13.00 to 13.50
Street car axles	16.00 to 16.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	7.50 to 8.00
Rails for rerolling	10.00 to 10.50
Cast iron borings, chemical	10.00 to 10.50

Prices per gross ton delivered consumers' yards:

Textile cast	$15.00 to $15.50
No. 1 machinery cast	15.00 to 15.50
No. 2 machinery cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Railroad malleable	13.50 to 14.00

Canada

Pig Iron Prices Are Shaded—Scrap Shows Softening Tendency

TORONTO, ONT., Nov. 29.—Pig iron sales in the Canadian market during the past week continued on about the same level as those of the three or four weeks previous. Inquiries for first quarter iron are making their appearance, but so far bookings have been confined to deliveries up to the end of the year and producers are not encouraging the closing of 1928 contracts. Local blast furnace representatives report a steady flow of spot orders ranging from 50 to 200 tons, and as these are fairly numerous the general volume of new business appearing is of satisfactory proportions. Deliveries against contract are going forward on schedule. Pig iron consuming interests in this country report no change in the daily melt. Most plants are operating between 60 and 80 per cent, with the occasional plant running at 100 per cent. Sanitary ware and radiator manufacturing plants are running close to capacity, and agricultural implement makers have increased operations. The latter, however, have little or no bearing on the Canadian pig iron market, since practically all the iron used is bought from United States producers. The low prices prevailing in the United States markets have been a factor in holding prices at a minimum here and, in some instances, have forced shading by Canadian producers. No downward revision of prices has been made, although the silicon

differential between No. 1 and No. 2 foundry iron has not been restored.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	25.50
No. 2 foundry, sil. 1.75 to 2.25	25.50
Malleable	25.50
Basic	24.50
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Old Material.—Small-tonnage spot orders are responsible for the only activity in an otherwise stagnant market. Taken as a whole, new business is dull, both in the Toronto and Montreal districts, although there is some movement of scrap on old contract account. No advance buying was reported during the week, and no inquiries are appearing outside those for small tonnages for immediate delivery. While most consumers throughout Ontario and Quebec have but limited supplies on hand and consequently are forced into the market at frequent intervals, tonnages involved in new orders are small. Consumers in the Hamilton, Ont., district are well supplied and are said to have enough scrap on hand to carry them along to the end of the year. The export demand has dropped, and Canadian dealers have no outlet for their surplus holdings other than domestic needs. Trading between dealers has also dropped off, and prices are showing a softening tendency. The only change during the week, however, was a decline of 50c. in heavy melting steel in the Toronto market.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast	....	16.00
Stove plate	....	12.00
Standard carwheels	....	14.50
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Buffalo

Pig Iron Inquiry Broadens—Scrap Strengthens on 30,000-Ton Purchase

BUFFALO, Nov. 29.—Pig iron inquiry has materially improved, with several sizable lots being sought. One is for 500 tons of No. 2 plain foundry, and another, for 1000 tons, part foundry and part malleable. Two other inquiries are for 700 tons and 350 tons of foundry respectively. So far as can be noted none of the furnaces has opened its books for first quarter, though deliveries on some of the iron that has been sold will lap over into that period. Price seems to be firm in this district at $17, furnace, for foundry and at $17.50 for malleable. A lower price quoted by one of the sellers on iron for New England delivery is understood to have been withdrawn.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2X foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Bar and shape specifications continue in fair volume, with prices firm. Sheet buying shows improvement. Black sheets are firm at 2.85c., base Pittsburgh, galvanized at 3.65c. and automobile body sheets at 4c. Reinforcing bar business is light, though jobs booked include one of 100 tons for a pack house for the Huron Cement Co. and another of 100 tons for School No. 9, Buffalo. Mill operations are picking up. The Lackawanna works is running 20 out of 24 open-hearth furnaces, and mill operations for the district average 80 per cent.

Old Material.—The feature of the market is a purchase by one of the mills of a considerable tonnage of heavy melting steel of both grades and busheling. This consumer is reported to have bought about 30,000 tons at $15 for the No. 1 steel. Dealers are paying $14.25 to $14.50 for No. 1 steel against this order and $12.75 to $13.25 for the No. 2 steel. The market is quiet except for this transaction, though other consumers are expected to buy very soon. Prices on No. 1 steel have strengthened to $14.50 to $15, and No. 2 steel to $13.75 to $14.25. Specialty buying has fallen off.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.50 to $15.00
No. 2 heavy melting steel	13.75 to 14.25
Scrap rails	13.25 to 13.75
Hydraulic compressed sheets	11.50 to 12.00
Hand bundled sheets	8.50 to 9.00
Drop forge flashings	11.50 to 12.00
No. 1 busheling	13.25 to 13.50
Heavy steel axle turnings	12.75 to 13.25
Machine shop turnings	9.25 to 9.50
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.50 to 15.75
Railroad coil and leaf springs	16.00 to 16.50
Rolled steel wheels	14.75 to 15.25
Low phosphorus billet and bloom ends	15.75 to 16.00
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.00
Blast Furnace Grades	
Short shoveling steel turnings	10.75 to 11.00
Short mixed borings and turnings	9.75 to 10.00
Cast iron borings	10.00 to 10.50
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades	
Steel car axles	14.50 to 15.00
No. 1 railroad wrought	12.00 to 12.50
Cupola Grades	
No. 1 machinery cast	14.50 to 15.00
Stove plate	12.75 to 13.00
Locomotive grate bars	10.50 to 11.00
Steel rails, 3 ft. and under	16.00 to 16.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Railroad	13.00 to 13.50
Agricultural	13.00 to 13.50
Industrial	13.00 to 13.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

October River Traffic in Pittsburgh District

Commerce of the Allegheny, Monongahela and Ohio Rivers in October, as reported in net tons by the United States Engineers' Pittsburgh office, was as follows:

Commodity	Allegheny River	Monongahela River	Ohio River
Coal	160,137	1,736,207	408,170
Coke	31,700	97,505	38,422
Gravel	125,438	95,800	160,400
Packet cargo	.....	.....	4,191
Sand	118,483	102,825	192,027
Iron and steel	2,700	80,273	80,423
Other commodities	5,900	19,466	11,305
Total	444,358	2,132,076	894,938

Cincinnati

Standard Sanitary Company Buys 10,000 Tons of Foundry Pig Iron

CINCINNATI, Nov. 29.—The purchase of approximately 10,000 tons of foundry iron by the Standard Sanitary Mfg. Co. for delivery to its Louisville, Ky., plant during the first half of 1928 was the outstanding transaction of the past week. No. 2 foundry iron from an Alabama furnace was bought at a delivered price of $19.39, or $16, base Birmingham. In addition, Granite City and Toledo producers will furnish No. 2X foundry iron at about $20.25, delivered. This would figure back to a base price of $16.10 at Toledo and $16.60 at Granite City. This sale, together with those of the previous week, makes a total of between 30,000 and 35,000 tons of iron sold in this district in the last 10 days, these bookings constituting the largest buying movement of the year. It is interesting to know that more than two-thirds of this tonnage consisted of Southern iron. Lake Erie foundry iron is quoted at from $16 to $16.50, base furnace. Southern Ohio iron remains at $19, base Ironton. A Hamilton, Ohio, company has closed for 600 tons of foundry iron, and another melter in that city is inquiring for 1000 tons for first half delivery.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25....	$20.89
So. Ohio malleable .....$20.14 to	20.89
Alabama fdy., sil. 1.75 to 2.25...	19.69
Alabama fdy., sil. 2.25 to 2.75...	20.19
Tennessee fdy., sil. 1.75 to 2.25..	19.69
Southern Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—November closes with specifications and orders considerably behind those of October. The most conspicuous decline in activities has been in the structural field, in which awards in the past month have been negligible. Fabricating shops are finding it necessary to depend upon small orders from week to week to keep them busy, and these are not large enough in the aggregate to justify operating at more than a moderate rate. The outstanding project at the moment is the Eighth Street viaduct in this city, for which 1300 tons of steel will be required. Bids on this job close on Dec. 9. Purchase of 500 tons of steel for the new building of the Young Women's Christian Association, Cincinnati, will be made this month. Aside from these two transactions, however, awards until after Jan. 1 are expected to be for minor tonnages. Bars, shapes and plates have become fairly well established at 1.80c., base Pittsburgh, and mills are asking 1.85c. for small lots. Little buying has developed at these prices, because consumers generally are covered for the remainder of the year and in most cases are not yet ready to consider their requirements for the early part of 1928. The situation in the wire goods market is practically the same as a week ago. Common wire nails continue at $2.59 per keg, delivered at the river bank in this city. The majority of Eastern mills are meeting this figure, which has been set by a river producer. Orders for sheets have shown no improvement, according to reports from manufacturers in this district. The price situation remains unchanged, with black bringing 2.90c., base Pittsburgh, blue annealed, 2.15c., and galvanized, 3.65c. to 3.75c.

Reinforcing Bars.—The West Virginia Rail Co. will supply 250 tons of rail steel bars for the high school of the Sisters of the Precious Blood, Cincinnati. The largest inquiry in many weeks calls for 3700 tons of bars for the Eighth Street viaduct in this city, bids for which close on Dec. 9. About 125 tons will be required for the local Linwood School. New billet stock is quoted at 1.85c., base Pittsburgh, and rail steel bars at 1.75c., base mill. These prices, however, are being shaded $1 a ton on attractive tonnages.

Warehouse Business.—From the standpoint of sales November has turned out to be one of the poorest months of the year. The slump has affected all products, although bars and structural steel have suffered the least. Prices remain unchanged.

Coke.—During December the price of by-product foundry coke will remain at $7.50 per net ton, f.o.b. ovens, and the schedule on by-product domestic grade also will not be altered. Specifications in the past month have been disappointing. The remainder of the year holds little promise of a betterment. Wise County and New River beehive coke are moving at only a fair rate.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Steel plants are taking small tonnages on contracts, but are doing no forward buying. In most cases consumers have liberal stocks on hand to supply current needs. Dealers are accumulating material in anticipation of an upturn in the market during the next 30 to 60 days. Foundry grades are sluggish because of the curtailed operations of foundries in this district. Prices remain unchanged, although evidences of weakness have cropped out in certain items.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel .....$10.75 to	$11.25
Scrap rails for melting ..... 11.50 to	12.00
Loose sheet clippings ..... 8.50 to	9.00
Bundled sheets ..... 9.50 to	10.00
Cast iron borings ..... 8.50 to	9.00
Machine shop turnings ..... 8.00 to	8.50
No. 1 busheling ..... 10.50 to	11.00
No. 2 busheling ..... 7.50 to	8.00
Rails for rolling ..... 13.00 to	13.50
No. 1 locomotive tires ..... 13.50 to	14.00
No. 1 railroad wrought ..... 11.00 to	11.50
Short rails ..... 17.00 to	17.50
Cast iron carwheels ..... 12.75 to	13.25
No. 1 machinery cast..... 16.00 to	17.00
No. 1 railroad cast..... 13.50 to	14.00
Burnt cast ..... 8.00 to	8.50
Stove plate ..... 9.25 to	9.75
Brake shoes ..... 10.00 to	10.75
Railroad malleable ..... 12.50 to	13.00
Agricultural malleable ..... 12.00 to	12.50

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes....	3.40c.
Bars, soft steel or iron.....	3.30c.
Reinforcing bars	3.30c.
Hoops ..... 4.00c. to	4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel ..... 4.75c. to	5.00c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue annealed sheets (No. 10)...	3.60c.
Structural rivets	3.85c.
Small rivets .....65 per cent off list	
No. 9 annealed wire, per 100 lb.....$	3.00
Common wire nails, base per keg.....	2.95
Cement coated nails, base 100 lb. keg.....	2.95
Chain, per 100 lb.....	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.....$	18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.	39.00

Youngstown

Pipe Order Swells Output—Additional Mergers Looked For

YOUNGSTOWN, Nov. 29.—The Youngstown Sheet & Tube Co. will furnish the 70,000 tons of 6, 8 and 10-in. pipe for the oil pipe line of the Roxana Petroleum Co. in Texas and Oklahoma, and the putting on of two additional open-hearth furnaces by that company this week is directly due to that order. This gives the company an operation of eight out of its 12 open-hearth furnaces at Campbell works, the highest rate in several weeks. The Republic Iron & Steel Co. also has slightly increased its active steel-making capacity this week, but the district as a whole is not producing ingots at more than 50 per cent of full capacity and sentiment in the trade is less cheerful than might be expected from the optimistic utterances of leaders in the banking and business worlds and the official announcement that the long awaited new Ford car will be shown in various parts of the country next Friday.

Sentiment in the sales departments of Youngstown steel companies, however, continues to be dominated by the condition of the sheet and pipe markets.

Outside of line pipe, there is seasonal dullness in tubular goods, while the failure of the sheet market to show any signs of strength has been a disappointment. Although at first disposed to ignore competitive sheet prices, leading local manufacturers have found it necessary to recognize them to hold their customers and have modified their quotations to 2.80c., base Pittsburgh, for black sheets; 3.65c., base, for galvanized; 2.10c., base, for blue annealed. On the last-named grade the price appears to be fairly steady, but 2.80c. is not as low as has been encountered on black sheets and 3.60c. is met with a little too frequently on galvanized sheets for the comfort of local producers. Automobile body sheets are weak, and while 4.15c., base, is still quoted, as low as 4c. has been done on orders emanating from large users.

These prices are disturbing to manufacturers, as they are not only low in relation to producing costs, but, prevailing at this particular time, are expected to make it difficult to get fair prices on early 1928 requirements. The advent of motor car builders in the market at this juncture would be helpful, but except for the possibility that the Ford Motor Co. will be a buyer as it gets into quantity production of the new model, there is no common expectation of buying of sheets by the automobile industry before the turn of the year. Ordinarily taking about one-third of the production of sheets, that industry is needed in the market to prevent excessive offerings of the ordinary finishes of sheets. Order books might be filled by acceptance of first quarter business at today's prices, but there is no tendency in that direction, since, after all, there is greater dissatisfaction with prices than with the volume of bookings.

Strip steel makers also are finding business slack. The movement of semi-finished steel reflects the low rate of sheet and tin mill operations. Except for the fact that some of the first half foundry iron placed by the Standard Sanitary Mfg. Co., Pittsburgh, will come to Youngstown, the pig iron market lacks activity.

The absorption of the Trumbull Steel Co., Warren, Ohio, by the Republic Iron & Steel Co., late last week is still being freely discussed. It is commonly looked upon as the first step in a combination which will eventually embrace the other companies in which C. S. Eaton, the Cleveland banker, is interested. These include the Otis Steel Co., Cleveland, and the Central Alloy Steel Corporation, Canton and Massillon, Ohio. There is little doubt here that the stockholders of the Trumbull and Republic companies will approve the merger. Speculation as to what the combination will mean in the operation of the two companies is rife. It is hinted that there will be an immediate curtailment of sheet production at the Trumbull plant and an increase in the output of tin plate, with the probable greater employment of the continuous mill at Warren in the rough rolling of steel for final finishing on the tin mills. It is recognized that there is not a market broad enough to take all of the production of the existing continuous strip mills, and, in using the mill at Warren as a breaking down mill for the tin mills, the company would be taking a leaf from the book of the American Sheet & Tin Plate Co. in the operation of its new mill at Gary, Ind.

Other mergers are being discussed here. While the recent issue of $75,000,000 of first mortgage 5 per cent bonds of the Youngstown Sheet & Tube Co. is solely for the purpose of refunding at a lower rate of interest its own bonds and those of its subsidiaries, it has become known that the company at the same time arranged for another of $100,000,000. This is commonly interpreted to mean that a merger in which Youngstown Sheet & Tube Co. would be the axis is under consideration. The amount of the issue, it is believed, will be used in refunding the bonded indebtedness of any companies that may be acquired.

It came out in the steel company merger discussion here that until a short time ago there was a possibility of a combination to embrace the Inland Steel Co., Chicago, the Corrigan, McKinney Steel Co., Cleveland, the Jones & Laughlin Steel Corporation, Pittsburgh, and one other company which could put into the combination a plant or plants of equally low cost operation. The dominant interest in each of these companies was said to be ready to retire from the business. It is said that inability to secure the right sort of man to head the combination was one reason for its failure. Indeed, getting a man who would typify high-class management is said to be standing in the way of completing several mergers which have been "on the fire" for some time.

The latest attempt to put together several small sheet manufacturers in and around Niles, like the earlier ones, appears to have failed. Difficulty in harmonizing ideas as to appraised values of the several companies is believed responsible this time.

Foundry Melt to Increase at Detroit in December

DETROIT, Nov. 29.—No further changes have developed in the scrap market in this district during the past week, but the December melt of pig iron promises to be on a higher level than in the present month. This is due primarily to one of the largest producers getting into production as of Dec. 1, and this increase will be felt by a number of automotive production shops. Prices same as quoted a week ago.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Heavy melting and shoveling steel	$11.75 to $12.25
Borings and short turnings	8.50 to 9.00
Long turnings	7.50 to 8.00
No. 1 machinery cast	16.00 to 17.00
Automobile cast	18.00 to 19.00
Hydraulic compressed sheets	10.00 to 10.50
Stove plate	11.50 to 12.50
No. 1 busheling	9.00 to 9.50
Sheet clippings	7.50 to 8.00
Flashings	9.75 to 10.25

REPUBLIC-TRUMBULL MERGER

Combination Will Have About 1,900,000 Tons Annual Ingot Capacity

Amalgamation of the Republic Iron & Steel Co. and the Trumbull Steel Co. was announced Nov. 25 by John A. Topping, chairman of the Republic company. An issue of about 290,000 shares of Republic common stock will be required under the conditions determined on to replace the Trumbull shares. Each share of preferred stock of the Trumbull company will be exchanged for 1 2/3 shares of the Republic common and each share of Trumbull common stock for 1/5 share of Republic common. The boards of directors of the two companies unanimously approved of the merger and it now remains for the stockholders to vote on the question.

The acquisition brings to the Republic company the new Trumbull wide strip mill, 12 sheet mills and tin plate capacity. The Republic company, which has large ore and coal resources and steel-making capacity beyond its capacity in finished products, thus obtains increased finishing capacity in a company without large resources in reserves of raw materials. The Trumbull Steel Co., among other things, has a 50 per cent interest in an efficient 600-ton blast furnace at Warren, Ohio, of the Trumbull-Cliffs Furnace Co., and a half interest in reserves of 6,250,000 tons of gas coal in Green County, Pa.

The merger will have about $60,000,000 par value in common stock, $25,000,000 in preferred stock and $35,000,000 in bonded indebtedness. Its ingot capacity is put at 1,900,000 tons. Interest charges on account of the bonds appear to be about $1.20 per ton of ingots. Finished products will include pipe, bars, plates, sheets, tin plates, terne plates and strips.

YOUNGSTOWN, Nov. 29.—Considerable interest is exhibited here in the personnel changes which will result from the Republic-Trumbull merger. It is understood that President John T. Harrington of the Trumbull company will have an important voice in the management of the consolidation. Mr. Harrington has been closely associated with C. S. Eaton, Cleveland, a heavy stockholder in both companies, and chairman of the Trumbull board. Sales offices of course will be consolidated.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Nov. 29	Nov. 28	Nov. 26	Nov. 25	Nov. 23
Lake copper, N. Y.	13.75	13.75	13.75	13.75	13.75
Electrolytic copper, N. Y.*	13.50	13.50	13.50	13.50	13.50
Straits tin, spot, N. Y.	59.12½	58.50	....	58.62½	58.12½
Lead, New York	6.40	6.30	6.30	6.30	6.30
Lead, St. Louis	6.10	6.05	6.05	6.05	6.05
Zinc, New York	6.25	6.25	6.20	6.20	6.20
Zinc, St. Louis	5.90	5.90	5.85	5.85	5.85

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Nov. 29.—Price trends in all the markets are higher and the Thanksgiving holiday hardly interfered with buying. Copper is strong, with some companies asking higher than the prevailing quotation. Activity in tin has been pronounced with prices a little higher. Lead quotations have been advanced in moderate buying and the tendency in zinc is still upward.

Copper.—A prominent feature has been further heavy demand from foreign consumers. It is estimated that export sales for the month will exceed those to domestic consumers. Yesterday sales by Copper Exporters, Inc., were very heavy and it is stated that November will show the highest total since that organization was incorporated. Domestic buying is fairly substantial. One or two producers have advanced their quotation for electrolytic copper to 13.87½c., delivered in the Connecticut Valley, but metal is still available at 13.75c. The quotation of Copper Exporters, Inc., is unchanged at 14.05c., c.i.f. Hamburg. It is expected that the domestic price will be established at 13.87½c., delivered, within a few days. Lake copper is quoted at 13.75c., delivered.

Tin.—Sales were large, totaling about 1800 tons for the week ended with Saturday, including 200 tons on that day. The greatest interest is in first quarter delivery and buyers for that period have consisted largely of dealers, though some consumers have been active. As compared with first quarter delivery, the market for spot, November and December is sluggish. There is more optimism prevalent and the tone of the market is reported much better. Yesterday and today the market has been only moderately active with spot Straits tin quoted today at 59.12½c., New York. A good business was done today, Tuesday. Prices in London today were but little changed from those of a week ago, with spot standard quoted at £267 7s. 6d., future standard at £265 7s. 6d. and spot Straits at £273 17s. 6d. The Singapore price today was £269. Arrivals thus far this month have been 4430 tons with 3710 tons reported afloat.

Lead.—The American Smelting & Refining Co. advanced its New York contract price late yesterday from 6.25c. to 6.30c., New York, which is the first increase since Aug. 3, and the first change in quotation since Sept. 9, both unusually long periods. The outside market is also higher at 6.10c., St. Louis, or 6.35c., New York. In general the market is firmer and in a sound, healthy condition. The advance by the leading interest is regarded by some as placing its quotation on a level with the outside market, but by others as a stimulant to the London market, where prices have been rather low for some time, and a drag on this market.

Later.—The leading interest late today (Tuesday) advanced its New York price to 6.40c.

Zinc.—The advance which began a week ago has continued, but with more moderation and prime Western zinc is quoted today, largely nominal, at 5.90c., St. Louis, or 6.25c., New York, for November-December delivery. For future positions a slight premium prevails. Consumer demand is very light at present, being hardly enough to establish the market. Ore prices were advanced another dollar per ton to $37, Joplin, last week, with production still high at about 14,000 tons and with sales below 7000. Stocks, which are large, are evidently in strong hands. The advance in ore, which means about ten points in the price of the refined metal, has not been reflected in the finished product.

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	60.50c. to 61.50c.
Tin, bar	62.50c. to 63.50c.
Copper, Lake	15.00c.
Copper, electrolytic	14.75c.
Copper, casting	14.00c.
Zinc, slab	7.50c. to 8.50c.
Lead, American pig	7.50c. to 8.50c.
Lead, bar	9.75c. to 10.75c.
Antimony, Asiatic	12.75c. to 13.25c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	39.25c. to 40.25c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	63.50c.
Tin, bar	65.50c.
Copper, Lake	14.50c.
Copper, electrolytic	14.50c.
Copper, casting	14.00c.
Zinc, slab	7.75c.
Lead, American pig	7.00c.
Antimony, Asiatic	16.00c.
Lead, bar	9.25c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	66.75c.
Solder, ½ and ½	37.75c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.50c. to 19.25c.
Copper, hot rolled	22.50c. to 23.50c.
Copper, cold rolled, 14 oz. and heavier	25.00c. to 26.00c.
Seamless Tubes—	
Brass	23.37½c. to 24.37½c.
Copper	24.25c. to 25.25c.
Brazed Brass Tubes	26.50c. to 27.50c.
Brass Rods	16.25c. to 17.25c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products are still being quoted at the advances of Nov. 21. There has been no change in the price of lead full sheets or zinc sheets since Oct. 5 and Aug. 5 respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.50c.
Copper, hot rolled	22.50c.
Zinc	10.00c.
Lead (full sheets)	9.75c. to 10.00c.
Seamless Tubes—	
High brass	23.37½c.
Copper	24.25c.
Rods—	
High brass	16.25c.
Naval brass	19.00c.
Wire—	
Copper	15.50c.
High brass	19.00c.
Copper in Rolls	21.50c.
Brazed Brass Tubing	26.50c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	19.50c.
Copper, hot rolled	22.50c.
Copper, cold rolled, 14 oz. and heavier	24.75c.
Zinc	11.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	24.87½c.
Copper	25.75c.
Brazed Brass Tubes	26.50c.
Brass Rods	16.25c.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Antimony.—Chinese metal for all positions is firm and unchanged at 10.87½c., duty paid, New York.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 25c. per lb., delivered.

RAILROAD EQUIPMENT

Chicago & North Western Orders Cars and Bodies—Prospects for Business Brighter

Railroad car buying appears more promising for the near future, with indications that the Baltimore & Ohio will soon come into the market for a considerable number of cars and bodies, while the Chicago & North Western may inquire for 2000 automobile cars. The latter road has just ordered 350 cars and 500 hopper car bodies, and is expected to take action shortly on 500 hopper cars and 500 flat cars.

Details of the week's business follow:

The Baltimore & Ohio Railroad is expected to come into the market in December for 2000 steel car bodies and possibly 2000 70-ton steel hopper cars.

The Hudson & Manhattan Co. has ordered 20 steel subway cars from the American Car & Foundry Co.

The Fruit Growers Express has placed an order for 240 steel underframes for refrigerator cars with the Pressed Steel Car Co.

The Chicago & Eastern Illinois will buy 500 automobile cars.

The Chicago & North Western has ordered 250 hopper car bodies from the Standard Steel Car Co., 250 hopper car bodies from the Illinois Car & Equipment Co., 250 gondola cars from the Standard Steel Car Co., and 100 gondola cars from an unnamed builder. This railroad has inquiries out for 500 hopper cars and 500 flat cars and is expected to come into the market for 2000 automobile cars.

The Toronto, Hamilton & Buffalo is in the market for two 2-8-2 type locomotives.

REINFORCING STEEL

Awards Total 3800 Tons—3700 Tons Wanted for Cincinnati Viaduct

Awards of concrete reinforcing steel in the week, as reported to THE IRON AGE, totaled about 3800 tons. New work up for bids makes the impressive total of about 9500 tons, including 3700 tons for a viaduct in Cincinnati and 3000 tons for a memorial bridge in Washington. Awards follow:

BRISTOL, R. I., 440 tons, Mount Hope Bridge, to McClintic-Marshall Co.

NEW YORK, 140 tons, Fieldston School in the Bronx, to National Bridge Works.

WILDWOOD, N. J., 150 tons, sewage disposal plant, to Concrete Steel Co.

NORFOLK, VA., 1500 tons, superstructure for James River bridge, to Jones & Laughlin Steel Corporation.

WORCESTER, MASS., 400 tons, Melville Shoe Corporation warehouse, to Bancroft & Martin Rolling Mill Co.

BUFFALO, 100 tons, pack house for Huron Cement Co., to a local maker.

BUFFALO, 100 tons, school No. 9, to a local maker.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.50c.	13.06c.
Copper, heavy and wire	11.375c.	12.625c.
Copper, light and bottoms	9.50c.	10.75c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.75c.	7.25c.
Heavy machine composition	9.00c.	10.25c.
No. 1 yellow brass turnings	7.75c.	8.50c.
No. 1 red brass or composition turnings	8.50c.	9.50c.
Lead, heavy	5.125c.	5.375c.
Lead, tea	4.25c.	4.75c.
Zinc	3.75c.	4.25c.
Sheet aluminum	13.00c.	15.00c.
Cast aluminum	12.75c.	14.75c.

CINCINNATI, 250 tons, high school for Sisters of the Precious Blood, to West Virginia Rail Co.

LOUISVILLE, KY., 125 tons, garage and office building for J. Graham Brown, to Laclede Steel Co.

CHICAGO, 300 tons, Salt Creek sewer, to an unnamed bidder.

CHICAGO, 200 tons of rail steel bars, Bittersweet Apartments, to Calumet Steel Co.

SAN FRANCISCO, 100 tons, factory building at Tenth and Howard Streets, to an unnamed local distributer.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEWARK, 800 tons, highway viaduct for New Jersey State Highway Department; O'Neill Co., Philadelphia, general contractor.

BALTIMORE, 250 tons, Clubhouse Apartment.

WASHINGTON, 3000 tons for Arlington Memorial bridge.

CLEVELAND, 350 tons, Marine Hospital.

CLEVELAND, 100 tons, pathological building for Western Reserve University.

CINCINNATI, 3700 tons, Eighth Street viaduct; bids close Dec. 9.

CINCINNATI, 125 tons, Linwood School.

SPRINGFIELD, ILL., 200 tons, Illinois State highway work.

ST. LOUIS, 750 tons, addition to Prospect Hill plant of Missouri Portland Cement Co.

LOS ANGELES, 162 tons for County work; bids in.

FABRICATED STRUCTURAL STEEL

Week's Awards of 28,000 Tons About Double Those of Preceding Week

Structural steel awards of 28,000 tons in the week were about double those of the preceding week, while new work added to pending business amounted to more than 19,000 tons. The largest award was 5000 tons for a bridge at Bristol, R. I., but there were others exceeding 2000 tons each. New York subway work, on which bids are being taken, requires 4100 tons of fabricated material. Awards follow:

STATE OF NEW JERSEY, 2300 tons, highway construction, to Phoenix Bridge Co.

STATE OF NEW JERSEY, 120 tons, bridge No. 190 at South River, N. J., to Phoenix Bridge Co.

AKRON, OHIO, 300 tons, post office building, to Berger Iron Works.

CLEVELAND, 600 tons, addition to plant of Cleveland Electric Illuminating Co., to American Bridge Co.

CLEVELAND, 1200 tons, transmission towers for Cleveland Electric Illuminating Co., to Blaw-Knox Co.

BOSTON, 350 tons, Battery March Building, to New England Structural Steel Co.

BOSTON, 110 tons, officers' quarters at City Hospital, to New England Structural Co.

PROVIDENCE, R. I., 600 tons, college building addition, to Levering & Garrigues.

PROVIDENCE, 350 tons, junior high school, to Providence Steel & Iron Co.

BRISTOL, R. I., 5000 tons, Mount Hope bridge, to McClintic-Marshall Co.

HARRISON, N. Y., 600 tons, Miriam Osborne Home, to McClintic-Marshall Co.

NEW YORK, 2775 tons in the following awards as reported to the Structural Steel Board of Trade, Inc.: 15-story apartment building at 40 East Sixty-first Street, to Lehigh Structural Steel Co.; nine-story apartment building at 153 Henry Street in Brooklyn, to Taylor-Fichter Steel Construction Co.; extension to Hell Gate station of United Electric Light & Power Co., to Post & McCord.

NEW YORK, 2000 tons, French Hospital, to Hinkle Steel Construction Co.

OYSTER BAY, L. I., 200 tons, school building, to an unnamed fabricator.

ALBANY, N. Y., 840 tons, Norman Skill viaduct, to McClintic-Marshall Co.

PHILADELPHIA, 2000 tons, Stanley Theater, to Belmont Iron Works.

PITTSBURGH, 425 tons, transmission towers for Duquesne Light Co., to American Bridge Co.

MARION, IND., 2350 tons, transmission towers for American Gas & Electric Co., to American Bridge Co.

HAMMOND, IND., 600 tons, pre-handling machinery supports for State Line Generating Co., to Vierling Steel Works, Chicago.

REIDSVILLE, N. C., 500 tons, office building for American Tobacco Co., to Virginia Bridge & Iron Co.

ROCKWOOD, ALA., 600 tons, stone mill and finishing plant, to Ingalls Iron Works, Birmingham.

CHICAGO, 198 tons, freight house for Chicago & Eastern Illinois, to McClintic-Marshall Co.

MILWAUKEE, 1700 tons, public safety building, to Milwaukee Bridge Co.

MILWAUKEE, 1300 tons, Milwaukee County General Hospital, to Worden-Allen Co.

KANSAS CITY, MO., 500 tons, building for Corn Products Co., to Gage Structural Steel Co., Chicago.

CRANBROOK, B. C., 300 tons, bridge over Kootenay River, to an unnamed company.

SAN FRANCISCO, 200 tons, plant for Michel & Pfeffer Iron Works; the company to do its own fabricating.

SAN FRANCISCO, 110 tons, apartment building on Pacific Street, to Central Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

TOLEDO, OHIO, 1200 tons, theater for Famous Players-Lasky Corporation.

NEW YORK CENTRAL RAILROAD, 5000 tons for bridge work.

CLEVELAND, 500 tons, White House grade crossing elimination to be awarded by the State Highway Commissioner, Columbus.

BOSTON, Dorchester district, 400 tons, Boston Elevated Railway bus terminal, previously reported as 200 tons.

STATE OF VERMONT, 1000 tons, miscellaneous highway bridges.

NEW YORK, 4100 tons, section 12, route 107, subways in Queens; bids close Dec. 21.

NEW YORK, 400 tons, apartment building at 141 West Seventy-ninth Street.

BROOKLYN, 1000 tons, Nurses' Home on Bushwick Avenue.

FOREST HILLS, L. I., 300 tons, parochial school.

TOMPKINSVILLE, N. Y., 250 tons, community house.

ORANGE, N. J., 300 tons, a memorial hospital.

PENN STATE, PA., 500 tons, building for Penn State College.

ROME, N. Y., 200 tons, school building.

DETROIT, 325 tons, enameling building for Chrysler Motor Corporation.

CLEVELAND, 600 tons, pathological building for Western Reserve University.

FOSTORIA, OHIO, 100 tons, factory building for National Carbon Co.

CINCINNATI, 1300 tons, Eighth Street viaduct; bids close Dec. 9.

CHICAGO, 1500 tons, approach to Robey Street bridge.

MILWAUKEE, 375 tons, Milwaukee County Dispensary; bids in.

OBITUARY

GEORGE H. LUTHER, vice-president and treasurer of the Luther Mfg. Co., Olean, N. Y., died at his home in that city on Nov. 21, aged 70 years.

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JAMES NEWTON GUNN, production engineer, died on Nov. 26 at his home in New York, aged 59 years. In the 1890s he organized the firm of Gunn, Richards & Co., engineers, who devoted themselves in large part to industrial management problems. For a time he was general manager of the Studebaker Co. In 1915 he was made vice-president and a director of the United States Rubber Co., serving that organization until 1923, when he retired from active business. He reentered the engineering field as receiver of the Hodgman Rubber Co. and was later attached to the engineering staff of Lockwood, Greene & Co.

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CHARLES B. MANVILLE, founder of the Johns-Manville Co. and its allied organizations, died on Nov. 26 at his home in Pleasantville, N. Y., aged 92 years. He established the industry at Milwaukee in 1858 and was its active head until his retirement in 1902. At that time the business was taken over by his son, the late Thomas F. Manville, and until last May it was headed by a second son, H. Edward Manville, who retired from the presidency to become chairman of the board.

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JUDGE ELLIOT M. WILSON, a pioneer steel manufacturer on the Pacific Coast and for 16 years president of the Pacific Coast Steel Co., San Francisco, died on Nov. 22 at the Franklin Hospital in that city, aged 82 years. He was born at Shalersville, Ohio, and after attending Hiram College, Hiram, Ohio, he studied law and was admitted to the bar in 1873. He first went to the Pacific Coast in 1893 in connection with legal matters involved in the construction of a steel plant at Lakeview, Wash. Judge Wilson later completed the plant and purchased it in 1897. In 1904 the plant was removed to Seattle. He organized the Pacific Coast Steel Co. in 1911 and has been head of the company since its inception. He has been a dominating personality in steel circles on the Pacific Coast.

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WILLIAM W. THOMPSON, president William W. Thompson Iron & Steel Co., Philadelphia, died Monday, Nov. 21, as the result of a fall over the balustrade of the seventh floor of the Stephen Girard Building. He was about 50 years of age.

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HENRY E. FRITZSCHE, Cleveland contracting manager of the Grinnell Co., Inc., died Nov. 23 after a three months' illness. He had been associated with the Grinnell organization and its predecessor, the General Fire Extinguisher Co., for almost 30 years.

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ALFRED CLIFFORD, in 1900 and 1901 chairman of the American Steel & Wire Co. and a pioneer steel manufacturer of the Middle West, died on Nov. 26 at his home in St. Louis, aged 82 years. He was born in Massachusetts and went to St. Louis as a young man, where he became associated with the Ludlow-Saylor Wire Co. Later he was secretary and treasurer of the company and also became associated with John W. Gates, William Edenborn and others in the operation of several barb wire manufacturing concerns. In 1885 he severed his connections with the Ludlow-Saylor company and became treasurer of the St. Louis Wire Mill Co. Shortly afterward this company became one of the constituents of the Consolidated Steel & Wire Co. and further consolidation in 1899 led to the formation of the American Steel & Wire Co. Mr. Clifford was treasurer of this company and later chairman of the board. When the United States Steel Corporation was formed in 1901 he was made a director, serving until 1917.

PERSONAL

B. W. deGuichard, since 1922 vice-president and general manager of the AC Spark Plug Co., Flint, Mich., has been made president and general manager of the company, succeeding the late Albert Champion. Although born in this country, Mr. deGuichard lived in France during his youth, returning to the United States in 1908, when he became associated with Mr. Champion in the manufacture of spark plugs. H. H. Curtice, who has been made vice-president and assistant general manager of the company, became associated with the accounting department in 1914.

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R. M. Plympton, formerly assistant sales manager for the Babson Statistical Association, Wellesley Hills, Mass., has been placed in charge of consumer motor sales at Chicago for the Lincoln Electric Co., Cleveland, and will work under the direction of R. D. Malm, Chicago district manager for the Lincoln company.

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W. C. Heckeroth, for 27 years associated with the Erie City Iron Works, Erie, Pa., as chief engineer and sales combustion engineer, has been appointed sales manager for the Fuel Efficiency Corporation, Birmingham, maker of unit-type powdered coal equipment. W. W. Pettibone, who has been assistant chief engineer in charge of the pulverized fuel engineering for the Erie City company, has become vice-president and chief engineer of the Fuel Efficiency Corporation.

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Gordon Lefebvre has been appointed vice-president in charge of operations for the Oakland Motor Car Co., Pontiac, Mich.

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R. C. Isaksen, who has been superintendent of the Brooklyn plant of the Addressograph Co., has been transferred to the main plant at 901 West Van Buren Street, Chicago.

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H. W. Brooks, formerly consulting engineer for the Erie City Iron Works, Erie, Pa., will reengage in private consulting practice with offices in St. Louis and New York.

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Robert P. Lamont, president of the American Steel Foundries, Chicago, has been made a director of the Illinois Bell Telephone Co. to succeed the late John J. Mitchell. Mr. Lamont is also director of the American Radiator Co., New York, the First National Bank, the International Harvester Co., Montgomery Ward & Co. and Armour & Co., all of Chicago.

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Dr. Otto Mulacek, managing director and operating head of the Poldi Steel Works, Prague, Czechoslovakia, and Oskar Jenisch, manager of the Komotau works of the Poldi organization sailed for Europe on Nov. 24, after having spent two months visiting steel mills and large industrial plants in the United States.

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Silvan J. Crooker, who has been made vice-president in charge of engineering for Heat Transfer Products, Inc., Mariners Harbor, N. Y., was not formerly chief engineer of the Whitlock Coil Pipe Co., Hartford, Conn., as stated in THE IRON AGE last week, but served in that company's engineering department.

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H. A. Jahraus has resigned as mechanical engineer of the Chisholm-Moore Mfg. Co., Cleveland, to engage in engineering work on material handling equipment in foundries and other industrial plants. His address is 1878 Haldene Road, Cleveland.

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E. J. Kulas, president Otis Steel Co., Cleveland, has returned from a several weeks' trip to Europe.

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Walter E. Nachtigall, a graduate of Case School of Applied Science, and formerly foundry superintendent for the Crucible Steel Casting Co., Cleveland, has joined the organization of the Republic Carbon Co., Niagara Falls, N. Y., as sales engineer.

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Henri Le Chatelier, a foremost figure in the scientific world and an outstanding leader in Europe in the forwarding of industrial management, has been made an honorary member of the American Society of Mechanical Engineers. He was graduated in 1869 from the Government Mining Corps of the Ecole Polytechnique and in 1877 was appointed professor of general chemistry at the Ecole des Mines. Ten years later he was made professor of industrial chemistry and general metallurgy at the same institution. In this capacity he made a study of combustion and of the measurement of high temperatures. Later he was a pioneer in the study of metallography, devising the metallographic microscope. He also devoted considerable time to the mechanics of chemistry, formulating a number of principles which are now generally accepted. In 1903 he created the *Revue de Métallurgie* to promote industrial science in metals. He was made a member of the French Académie des Sciences in 1907. M. Le Chatelier is professor of experimental chemistry at the School of Mines of Paris, and professor of the faculty of sciences of the University of Paris.

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Axel Sahlin, consulting engineer of international reputation, particularly in steel works design and construction, will leave for Europe on Dec. 3, after spending a number of weeks in Canada and the United States. He resides at Monte Carlo.

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Thomas J. Llewelyn has been appointed manager of a Pittsburgh sales office recently opened in the Oliver Building by the Valley Brass & Bronze Co., New Kensington, Pa.

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Fred Kingston, for the past several years sales manager of the Willamette Equipment Co., Portland, Ore., has been made manager of the company, having taken over the interest of the late Harold P. Richards.

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William H. Woodin, chairman of the board of the American Locomotive Co. and president of the American Car & Foundry Co., has been elected president of the Locomotive company, succeeding the late F. F. Fitzpatrick. This is the second time Mr. Woodin has been the executive head of the latter company, having held the position for a year prior to May, 1926, when he resigned in favor of Mr. Fitzpatrick. He is a director in the General Motors Corporation, the American Ship & Commerce Corporation and the Federal Reserve Bank of New York.

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Richard G. Park, Jr., has been elected vice-president and Robert C. Lea secretary and treasurer of the Eagan-Johnson Steel & Iron Co., Crum-Lynne, Pa.

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Grant B. McLaughlin has been named resident manager of Rogers Brown & Crocker Brothers' Buffalo office, effective Dec. 1.

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M. A. Grossman and E. C. Bain returned recently from Europe on the Aquitania. They are research metallurgists with the Central Alloy Steel Corporation, Canton, Ohio, and the Union Carbide & Carbon Research Laboratories, Long Island City, N. Y., respectively, and attended the international testing congress at Amsterdam, the Netherlands, in September.

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The Machine Tool Congress, organized in Cleveland, Sept. 21, has been invited to take part in the sessions of the machine shop practice division of the American Society of Mechanical Engineers, to be held Dec. 6 and 7, during the annual meeting of the society in New York.

NO BOOM SINCE 1923

Recovery of Farmer Essential to Prosperity—Agricultural Commission Commended

Discussing the report of the Business Men's Commission on Agriculture, Virgil Jordan, chief economist National Industrial Conference Board, New York, told the Rhode Island Agricultural Conference at Providence, Dec. 1, that the commission's report reflected the "growing uneasiness of many intelligent and far-sighted business men about our bootstrap prosperity."

"The illusion that our city industries and trade can lift themselves indefinitely by their bootstraps to ever higher levels of prosperity without taking the farmer along," Mr. Jordan said, "may have existed for a time during the past five years, but it has not lasted very long. Our much vaunted prosperity in recent years has had something illusory, uncertain and exceedingly uneven about it. Business as a whole has not shown much more than the normal rate of growth since 1922. All the great basic raw material producing industries, such as coal, chemicals, agriculture, metal mining, and some of those closest to them, like the wool and cotton textiles, leather, and lately iron and steel, have certainly shared little or none of the restless, shifting and selective prosperity which has been so extravagantly hailed. Thanks to the easy-money policy of the Federal Reserve System the stock market has been doing some fancy aviation, but there has been no real business boom in this country since 1923.

"The prime reason for this is the slow and uncertain recovery of our agriculture from the depression of 1921, and the persistently subnormal purchasing power of the enormous part of our domestic market represented by the farm population. Even the enormous foreign loans by which our export trade has been largely sustained, and the growth of instalment selling which has been academically certified as the cause of our recent prosperity, have not fully offset the drag upon general business which unfavorable agricultural conditions have caused. We shall have no general all round prosperity in this country until the farmer has some of it too, for real prosperity starts at the ground and works up from the bottom.

"Intelligent and far-sighted business men have more and more clearly realized these things in the past year and a half. They have looked with ever greater skepticism upon the promised land flowing with the skimmed milk of instalment paper and the honey of deferred payments. The margin of profit in the great urban business of taking in each other's washing has steadily declined.

"If general business conditions in this country during the past five years are correctly diagnosed, it will be seen that the old principle of interdependence of agriculture and industry holds today as much as ever, and that true urban prosperity can never be the companion of farm depression. If business had indeed been generally good in this country in recent years in spite of or by virtue of the farm depression, I am sure there would be a drastic balancing of accounts in store for us in the near future. Instead I have every confidence that if there is any real prosperity in the picture it is ahead of us and not behind us, and that the most important factor in the expansion will be, not Mr. Ford's new car, but the long delayed agricultural recovery which will enable Mr. Farmer to buy Mr. Ford's new car and lots of other things he needs but hasn't been able to buy so far."

Mr. Jordan said that the Business Men's Commission report had given an entirely new turn to the problem of agricultural relief. "It shows," he said, "that business has become wide awake to the importance of the agricultural question and has vigorously and aggressively taken a hand in it. Many people feel that business has only put its foot in it, but in the end it will be seen that it has really taken the agricultural problem out of the fumbling hands of its political partisans and strategists and put it on a basis where it can be dealt with honestly and intelligently."

The commission, Mr. Jordan said, has not recommended any sweeping reduction of the tariff. "For the first time in any document of this kind the tariff is dealt with not as a partisan question and not on the basis of deep-rooted prejudices regarding protection or free trade, but as an instrument of great power and usefulness for determining the national development. Notwithstanding the erroneous impressions which some public officials and others have gained from considering the report without reading it, the commission takes no dogmatic position on the tariff. It gives due credit to the tariff for the important part which it has played in our economic development and demands only that it continue to be used for this purpose in the wisest way."

NEW TRADE PUBLICATIONS

Steam Turbines.—Dean Hill Pump Co., Anderson, Ind. Bulletin 1202, fully covering the company's wait type steam turbines, especially adapted to the requirements of high pressure and temperature steam. Of particular interest is a chart for figuring approximate water rates for turbines.

Ingot Iron Sheets.—American Rolling Mill Co., Middletown, Ohio. Brief account of the electrolytic theory of corrosion, and the purity and rust resisting properties of sheet metal made from Armco ingot iron, illustrated with photographs of structures successfully using this product to resist unusually severe corrosive surroundings.

Radial Bearings.—Rollway Bearing Co., Syracuse, N. Y. Bulletin 52 deals with radial bearings for roll neck service, particularly for steel rolling mills, but designed also for rubber, paper and textile calendar rolls and sugar mill pressure rolls. Bulletin 51 shows a crane hook on roller bearings.

Views in Large Industrial Plant.—McMyler-Interstate Co., Bedford, Ohio. A pamphlet of 32 pages consisting mainly of photographic reproductions showing the chief shops of the company, with work in progress. In the second half of the pamphlet are installation views, showing equipment of the company at work in various places.

Industrial Furnaces.—W. S. Rockwell Co., 50 Church Street, New York. Bulletins 280, 281 and 284 feature respectively continuous annealing furnaces of the conveyor type for annealing and heat treating ferrous and non-ferrous metal parts; electric furnaces of several types for heating small parts or heat treating or annealing purposes; continuous heat-treating furnaces using either electricity or fuel and operated on the conveyor principle.

Heavy-Duty Loaders.—George Haiss Mfg. Co., Inc., New York. Catalog 527, containing announcement of changes in the company's creeper heavy-duty loader. Notable among them are the inclosure of the crowder worm mechanism in the transmission and the placing of the elevator on the longitudinal center line of the machine.

Electric Industrial Heating Apparatus.—Westinghouse Electric & Mfg. Co., East Pittsburgh. Complete catalog of industrial electric heating apparatus, listing 27 different types of equipment, including box furnaces; lead and salt baths and pots; pit, rotary hearth and pusher furnaces; special furnaces and ovens; drawing baths and ovens; baking ovens; laboratory furnaces; strip heaters of all classes; automatic melting pots, and control equipment and accessories. For standard furnaces and ovens, production curves guide to advance estimating of the kilowatt hours required to turn out a certain amount of steel when heated to a definite temperature.

Contract Machining.—Chowning Regulator Corporation, Corning, N. Y. Four-page folder illustrating machine parts, including gears of various types, made by the company on contract, according to requirements and specifications.

Maintenance of Acetylene Generators.—Union Carbide Sales Co., 30 East Forty-second Street, New York. Pamphlet of 24 pages scheduling and describing the daily, weekly, quarterly and annual inspections desirable for correct maintenance of generators of welding and cutting gas, together with suggestions for trouble-chasing, prevention of freezing, and disposal of residue.

Exports Up 4000 Tons; Imports Lower

For Ten Months, Imports Are 35 Per Cent Down—Exports of Scrap Unusually Large This Year

WASHINGTON, Nov. 28.—Exports of iron and steel products in October made a slight increase to 170,255 gross tons, from 166,352 tons in September. Imports decreased to 52,503 tons, compared with 58,464 tons. Aggregating 1,834,613 tons for the 10 months ended with October, exports showed an increase of 85,467 tons over the corresponding period of last year, due to heavy outgoing movement of scrap.

Exports for the current year have averaged 183,000 tons monthly in round figures. If this rate is maintained, the year's total will run close to 2,200,000 tons. This is but 5 per cent of a rated rolled steel capacity of 44,000,000 tons. Authorities in the trade have estimated that the United States has 10,000,000 tons available for export, and have pointed out that should such an attractive business develop, or even one-half that amount be exported, the domestic market situation would be much firmer and more satisfactory. Of the October exports, 67,267 tons, or nearly 40 per cent, went to Canada.

Tin plate constituted the largest item of export in October, with a total of 17,940 tons, of which 5460 tons went to Japan, 2752 tons to Canada and 1653 tons to Argentina. Exports of steel rails for the month amounted to 13,451 tons, of which 3255 tons went to Cuba and 3140 tons to Japan. That Canada is supplying her own markets in this product is evident from the small export movement going to that country from the United States and other countries.

On the other hand, Canada took virtually all of the 13,202 tons of plain structural shapes exported in October, and but a small quantity of the 5803 tons of fabricated material, on which there is a considerable duty levied by Canada, in an effort to build up its own fabricating plants. Canada took 4021 tons and Japan 1479 tons of the 8856 tons of black steel sheets exported in October. Canada also took 7359 tons of the 8040 tons of plates exported during the month, and took 5962 tons of the 9207 tons of steel bars entering foreign markets in October.

General Decline in Imports

Except for the groups including hoops, bands and cotton ties and rolled tubular products, there was a general decline in imports of the more prominent items in October when compared with September, and also a decrease in the pig iron incoming movement. The leading source of imports in October was Belgium, which supplied 12,652 tons. France came second with 11,963 tons.

Of the 13,180 tons of shapes imported, Belgium supplied 6330 tons; France, 3801 tons, and Germany, 3008 tons. Of the 5265 tons of cast iron pipe imported, 3921 tons came from France and 1344 tons from Belgium. Steel bar imports totaled 5261 tons, of which 2626 tons came from Belgium, 902 tons from Germany and 885 tons from France. India provided 5196 tons and the

Imports of Iron and Steel into the United States

(In Gross Tons)

	October		Ten Months Ended October	
	1927	1926	1927	1926
Pig iron	8,178	18,847	102,627	413,430
Ferromanganese*	2,109	3,067	23,220	32,106
Ferrosilicon†	94	1,812	6,657	10,092
Ferrochrome‡	3	....	415	449
Scrap	5,172	13,347	50,337	72,657
Pig iron, ferroalloys and scrap	*15,556*	*37,073*	*183,256*	*528,734*
Steel ingots, blooms, billets and slabs	1,149	1,783	10,598	28,511
Iron blooms, slabs, etc.	91	....	91	323
Wire rods	2,688	1,289	14,103	8,016
Semi-finished steel	*3,928*	*3,072*	*24,792*	*36,850*
Rails and splice bars	541	5,396	15,161	59,716
Structural shapes	13,180	10,892	132,840	95,297
Boiler and other plates	2	270	3,250	3,892
Sheets and saw plates	1,234	1,257	13,240	7,886
Steel bars	5,261	9,273	77,726	89,351
Bar iron	10	405	3,168	4,577
Hoops, bands and cotton ties	3,194	2,768	29,583	21,210
Tubular products (wrought)	2,286	2,128	45,444	20,726
Nails, tacks, staples	234	571	5,155	4,184
Tin plate	70	14	1,050	2,049
Bolts, nuts, rivets and washers	22	46	311	351
Round iron and steel wire	202	452	3,372	3,382
Barbed wire	248	58	3,734	2,674
Flat wire; strip steel	287	319	2,261	3,080
Steel telegraph and telephone wire	....	914	32	1,035
Wire rope and strand	122	169	1,921	2,325
Other wire	642	1	1,109	1,431
Wire cloth and screening	....	29	....	280
Rolled and finished steel	*27,535*	*34,962*	*339,357*	*323,446*
Cast iron pipe	5,265	6,553	74,615	62,401
Castings and forgings	219	170	2,377	2,082
Total	52,503	81,830	624,397	953,513
Manganese ore*	14,780	13,331	246,829	307,167
Iron ore	228,275	190,229	2,289,303	2,164,571
Magnesite (dead burned)	29	2,160	36,222	64,553

*Manganese content only. Imports of manganese ore from Cuba in October, 1927, total 176 gross tons, and for the 10 months ended October the total was 6664 tons.
†Silicon content only.
‡Chromium content only.

Exports of Iron and Steel from the United States

(In Gross Tons)

	October		Ten Months Ended October	
	1927	1926	1927	1926
Pig iron	4,735	2,205	39,823	18,833
Ferromanganese	1,005	49	1,539	573
Scrap	25,231	7,872	200,243	90,893
Pig iron, ferroalloys and scrap	*30,971*	*10,126*	*241,605*	*110,299*
Ingots, blooms, billets, sheet bar, skelp	9,921	13,005	80,644	80,057
Wire rods	2,276	978	14,060	14,304
Semi-finished steel	*12,197*	*13,983*	*94,704*	*94,361*
Steel bars	9,207	10,562	92,496	111,790
Alloy steel bars	799	414	4,827	4,142
Iron bars	144	317	3,626	4,226
Plates, iron and steel	8,668	10,550	112,394	113,151
Sheets, galvanized	9,709	12,104	132,143	142,250
Sheets, black steel	8,856	15,119	134,702	140,827
Sheets, black iron	851	1,120	13,679	15,235
Hoops, bands, strip steel	2,993	3,521	36,273	39,331
Tin plate; terne plate	17,940	27,950	220,154	190,885
Structural shapes, plain material	13,202	10,922	119,913	131,022
Structural material fabricated	5,803	3,260	54,590	66,751
Steel rails	13,451	13,917	149,023	144,727
Rail fastenings, switches, frogs, etc.	1,765	3,144	28,588	35,575
Boiler tubes, welded pipe and fittings	14,985	21,023	221,732	224,528
Plain wire	3,233	1,844	29,074	27,724
Barbed wire and woven wire fencing	5,235	2,999	43,844	46,171
Wire cloth and screening	200	112	1,955	1,625
Wire rope	277	293	3,691	3,956
Wire nails	937	1,253	7,532	10,411
Other nails and tacks	676	517	6,987	6,902
Horseshoes	76	97	470	571
Bolts, nuts, rivets and washers, except track	1,033	924	10,043	11,366
Rolled and finished steel	*120,040*	*141,962*	*1,427,736*	*1,473,166*
Cast iron pipe and fittings	3,585	2,641	23,600	28,076
Carwheels and axles	1,113	923	14,941	14,770
Iron castings	650	749	9,402	7,861
Steel castings	358	429	6,081	6,512
Forgings	401	150	4,169	2,410
Castings and forgings	*6,107*	*4,892*	*58,193*	*59,629*
All other	940	1,107	12,375	11,691
Total	170,255	172,070	1,834,613	1,749,146

Destination of Iron and Steel Exports from the United States

(In Gross Tons)

Country of Destination	October 1927	Ten Months Ended October 1927	Ten Months Ended October 1926
North and Central America and West Indies	*87,908*	*914,413*	*925,667*
Canada and Newfoundland	67,401	699,432	701,019
Cuba	9,359	82,342	73,794
Mexico	4,816	68,889	86,883
Guatemala	283	5,639	9,261
Salvador	285	3,578	12,630
Panama	1,276	16,269	6,746
Other British West Indies	774	10,908	7,777
Other West Indies	2,890	16,901	14,874
Other Central America	824	10,455	12,683
South America	*21,043*	*290,120*	*278,100*
Argentina	5,629	68,266	46,625
Brazil	3,091	57,630	41,120
Chile	2,565	35,603	51,674
Colombia	4,537	48,214	49,844
Peru	1,294	28,372	29,475
Venezuela	2,516	39,809	49,786
Other South America	1,411	12,226	9,576
Europe	*20,232*	*177,644*	*111,649*
France	67	4,218	8,591
Italy	59	40,019	22,738
Rumania	33	1,384	2,345
Russia	1,665	7,409	2,863
Turkey in Europe	804	2,961	2,751
United Kingdom	4,268	57,929	50,577
Other Europe	13,336	63,734	23,784
Far East	*39,489*	*437,488*	*416,191*
Australia	3,099	23,399	22,974
British Malaya	659	7,479	10,450
China	2,473	44,706	31,773
Dutch East Indies	3,146	31,132	33,402
India	771	23,040	29,954
Japan	20,619	227,446	208,450
Kwangtung	2,306	18,441	19,876
Philippine Islands	5,557	51,497	49,799
Other Asia and Far East	859	10,348	9,513
Africa	*1,583*	*14,948*	*15,539*
British South Africa	1,227	7,356	7,937
Egypt	83	3,122	5,115
Portuguese East Africa	208	3,575	1,928
Other Africa	65	895	559
Total	170,255	1,834,613	1,749,146

Netherlands 2260 tons of the 8178 tons of pig iron imported during October.

Imports of manganese ore, exclusive of those from Cuba, totaled 14,780 tons of concentrates, of which 4755 tons came from Russia and 2455 tons from Brazil. Imports of manganese ore from Cuba totaled 176 gross tons for the month and 6664 gross tons for the 10-month period. The Division of Statistics is now reporting manganese concentrate imports from Cuba, also, showing imports of this character to have been 140 tons in October and 3192 tons for the 10 months.

Larger Imports of Iron Ore

October imports of iron ore, at 228,275 gross tons, exceeded the September figure (224,524 tons) by 1¾ per cent, according to the Department of Commerce. The October movement was close to the average of the preceding nine months. For the ten months, this year shows a gain over last year of 124,732 tons, or nearly 6 per cent. Tonnage from Cuba has fallen off 27 per cent from last year, but this has more than been made up by heavily increased shipments from Sweden and from French Africa. Particulars are given in the table.

Sources of American Imports of Iron Ore

(In Gross Tons)

	October 1927	October 1926	Ten Months Ended October 1927	Ten Months Ended October 1926
Chile	121,800	91,400	1,166,400	1,131,600
Cuba	25,500	38,500	340,113	467,000
Spain	448	.....	27,165	82,412
Sweden	21,470	9,241	217,272	39,491
French Africa	48,999	12,900	419,821	285,962
Canada	423	571	16,658	16,388
Other Countries	9,635	37,617	101,874	141,718
Total	228,275	190,229	2,289,303	2,164,571

The Logan Coal Co., Philadelphia, has taken over the New York office of the Pioneer Coal & Coke Co., and has been appointed exclusive selling agents in that territory for furnace, foundry and domestic coke of the Pioneer company. O. V. Feeney, formerly resident manager at New York for the Pioneer organization, is now associated with the Logan company.

BRITISH IMPORTS HIGHER

Exports of Iron and Steel Stationary—Effects of Rebate Scheme Not Yet Apparent

WASHINGTON, Nov. 29.—Returns covering the British overseas trade in iron and steel during October reveal a rapidly increasing import trade and a virtually stationary export trade. Imports totaled 336,020 gross tons and exports 384,781 tons, says a cablegram received by the Department of Commerce from Commercial Attaché William D. Cooper, London. The October trade represented the second consecutive increase in imports of approximately 25,000 tons, recorded by month-to-month comparison. The figures for exports and imports are as follows:

BRITISH FOREIGN TRADE IN IRON AND STEEL IN 1927

(In Gross Tons)

Item	Imports Sept.	Imports Oct.	Exports Sept.	Exports Oct.
Pig iron and ferroalloys	34,702	39,898	30,939	30,863
Ingots, blooms, billets and slabs	127,190	152,901	1,394	1,524
Iron bars, rods and angles	22,478	19,813	2,446	3,101
Steel bars, rods and angles	39,465	42,826	26,154	27,567
Structural steel	12,849	12,862	10,065	8,162
Hoops and strips	15,157	11,805	4,122	4,154
Plates and sheets	26,301	22,986	41,581	37,725
Galvanized sheets	.....	.....	74,937	66,687
Tin plate	.....	.....	36,941	36,027
Cast tubes, pipes and fittings	4,047	3,220	9,938	12,021
Wrought tubes, pipes and fittings	5,488	4,440	20,722	25,518
Rails	1,140	1,420	57,452	48,874
Other railroad material	1,348	524	21,605	34,568
Wire	3,693	4,036	7,147	5,353
Wire cable and rope	.....	.....	2,058	2,053
Wire nails, including staples	5,746	5,608	201	209
Wire manufactures, not elsewhere specified	428	561	1,238	1,384
Nails, tacks, rivets and washers	861	772	1,736	1,804
Bolts and nuts, including screws for metal	1,118	1,101	2,607	2,397
Iron and steel castings	1,319	1,849	258	213
Iron and steel forgings	1,128	1,418	42	52
All other manufactures	7,560	7,980	31,336	34,525
Total	312,018	336,020	384,919	384,781

Canadian Output of Pig Iron Declines in October—Steel Production Gains

TORONTO, ONT., Nov. 29.—The production of pig iron in Canada for the month of October amounted to 38,097 gross tons. This was the lowest output reported for any month since September, 1925, and was 27 per cent below the 52,470 tons reported for the previous month and 46 per cent below the tonnage produced in October, 1926. Compared with September October's production showed declines in all grades. Basic iron output dropped from 35,609 tons in September to 30,356 tons in October; foundry iron was down from 11,979 tons in the previous month to 7749 tons in the month under review, while there was no malleable iron produced in October, as compared with 4882 tons in September.

For the 10 months ended with October, blast furnace production totaled 608,511 gross tons, or 4 per cent below the 631,189 tons produced during the corresponding period of 1926. This year's output included 431,674 tons of basic iron, 145,443 tons of foundry iron and 31,394 tons of malleable iron.

During the month one furnace at Hamilton, Ont., was blown out for relining, with the result that at the end of October only three blast furnaces were blowing. On Nov. 14, however, the starting up of rail mills at Sault Ste. Marie, Ont., and increased operations at Sydney, N. S., resulted in the blowing in of one additional blast furnace each, making a total of five active blast furnaces out of 18 in the Dominion.

The production of steel ingots and direct steel castings in October amounted to 56,371 gross tons, an increase of 4 per cent over the 54,250 tons reported for September, but a decrease of 11 per cent when compared with the 63,542 tons produced in October last year. For the 10 months ended with October the production of steel ingots and castings totaled 730,660 tons, an increase of 10 per cent over the 664,084 tons produced during the corresponding period of 1926. This year's output included 695,688 tons of ingots and 34,972 tons of direct steel castings, as compared with 635,124 tons of ingots and 28,960 tons of direct steel castings for the corresponding 10 months of 1926.

British Reduce Home Pig Iron Prices

Domestic and Export Markets Made Uniform—German Mills Ask Delay on 8-Hr. Day —Ferromanganese Producers of Europe Agree

(*By Cable*)

LONDON, ENGLAND, Nov. 28.

CLEVELAND pig iron makers have reduced prices 2s. 6d. (61c.) per ton to domestic users, making the price uniform for home, Scottish and export consumers. The market is otherwise quiet but furnaces believe new business may be attracted by this revision.

Hematite prices are firmer as a result of increased sales, good tonnages having been sold to German and Belgian consumers. Foreign ore is quiet.

Finished steel demand for plates is dull, but the domestic market on structural and engineering materials is good. Additional new ship orders have been placed, but plate rolling mills are badly in need of work.

Tin plate activity has continued and makers are booking some good orders for domestic and export shipment as far forward as June. Many mills have decided to close for three weeks through Christmas and New Years under the plan of restriction of output.

Galvanized sheets are dull and prices weak. There is some demand for Japanese thin gage black sheets and there have been a few merchant sales. The market is otherwise quiet.

Continental iron and steel prices are firm, although business is quiet. British consumers of semi-finished are requesting that deliveries be delayed as they have large stocks on hand and are unable to secure sufficient orders for their own manufactured products, especially sheets.

The International Steel Cartel meets Dec. 9 to discuss revision of production quotas. France is expected to ask for a reduction in the French quota. The question of establishment of a sales organization for semi-finished material is not on the agenda, as insufficient progress has been made.

MILLS ASK DELAY ON 8-HR. DAY

German Steel Works Find Time Too Short for Change on January First—Business Good

BERLIN, GERMANY, Nov. 12.—The steel plants and rolling mills have petitioned the Cabinet for an extension of time on the provisional ordinance which restores the 8-hr. day to these mills, effective Jan. 1. The 8-hr. day has been in force at the blast furnaces for some time. The mills state that the five and one half months given them from the time of passage of the ordinance, July 16, to the date it becomes effective, Jan. 1, is too short a period to enable them to adapt their plants and organizations to the three-shift day. The change, it is pointed out, requires large expenditures, which cannot be provided for in the short term given.

Business continues good and unemployment registered a further decline in the latest report, with only 442,000, compared with more than 2,000,000 in February. Oct. 1 the average wage of skilled workers in the metal industry was 47.90m. ($11.43) a week and of unskilled workers 33.31m. ($7.95) a week. The general activity of business and the rise in the cost of living has caused a certain amount of labor unrest. In the second quarter of 1927 there were in Germany 246 strikes, involving a loss of 812,000 working days, compared with 101 strikes with a loss of 261,000 working days, in the second quarter of 1926.

Export Bar Prices Higher

Domestic prices of the pig iron and steel syndicates are unchanged, although there is still considerable discussion of the possibility of an advance, which might be necessary with the 8-hr. day in effect. It is doubtful, however, with export prices so low that a domestic increase would be possible. While domestic business in pig iron is good at present, even with the current level of prices there are complaints of competition of British, Belgian and Dutch iron in the export market. Steel mills are booked with sufficient business for several months and an increase is reported in export sales of semi-finished material and railroad permanent way ma-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:

Durham coke, del'd.	£0	17½s.				$4.27		
Bilbao Rubio ore*	1	1				5.11		
Cleveland No. 1 fdy.	3	7½				16.44		
Cleveland No. 3 fdy.	3	5				15.83		
Cleveland No. 4 fdy.	3	4				15.59		
Cleveland No. 4 forge	3	3½				15.46		
Cleveland basic (nom.)	3	15	to £3	15½s.		18.27	to	$18.39
East Coast mixed	3	11				17.29		
East Coast hematite	3	11½				17.42		
Rails, 60 lb. and up.	7	15	to	8	0	37.75	to	38.96
Billets	6	0	to	6	10	29.22	to	31.66
Ferromanganese	13	0				63.31		
Ferromanganese (export)	11	10	to	12	0	56.01	to	58.44
Sheet and tin plate bars, Welsh	5	7½	to	5	15	26.18	to	28.01
Tin plate, base box	0	17¾	to	0	18¼	4.32	to	4.44
Black sheets, Japanese specifications	13	5	to	13	10	64.53	to	65.75
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.66	to	1.77
Boiler plates	10	10	to	11	0	2.28	to	2.39
Tees	8	2½	to	8	12½	1.77	to	1.99
Channels	7	7½	to	7	17½	1.60	to	1.71
Beams	7	2½	to	7	12½	1.55	to	1.66
Round bars, ¾ to 3 in.	7	5	to	7	15	1.58	to	1.69
Steel hoops	10	10	to	11	0	2.28	to	2.39
Black sheets, 24 gage	10	5	to	10	10	2.23	to	2.28
Galv. sheets, 24 gage	13	2½	to	13	5	2.85	to	2.88
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.04	to	3.10

*Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	1s.	to £3	1½s.	$14.85	to	$14.97	
France	3	1	to 3	1½	14.85	to	14.97	
Luxemburg	3	1	to 3	1½	14.85	to	14.97	
Basic pig iron:								
Belgium	2	18	to 3	0	14.13	to	14.61	
France	2	18	to 3	0	14.13	to	14.61	
Luxemburg	2	18	to 3	0	14.13	to	14.61	
Coke	0	18			4.39			
Billets:								
Belgium	4	3	to 4	5	20.21	to	20.70	
France	4	3	to 4	5	20.21	to	20.70	
Merchant bars:					C. per Lb.			
Belgium	4	16	to 4	17	1.06	to	1.07	
France	4	16	to 4	17	1.06	to	1.07	
Luxemburg	4	16	to 4	17	1.06	to	1.07	
Joists (beams):								
Belgium	4	8	to 4	10	0.97	to	0.99	
France	4	8	to 4	10	0.97	to	0.99	
Luxemburg	4	8	to 4	10	0.97	to	0.99	
Angles:								
Belgium	4	15			1.05			
⅛-in. plates:								
Belgium (a)	6	5	to 6	6	1.38	to	1.39	
Germany (a)	6	5	to 6	6	1.38	to	1.39	
⅜-in. ship plates:								
Belgium	6	0	to 6	1	1.33	to	1.34	
Luxemburg	6	0	to 6	1	1.33	to	1.34	
Sheets, heavy:								
Belgium	6	1			1.34			
Germany	6	1			1.34			

(a) Nominal.

terials. Mill deliveries are still extended on many products to from 8 to 10 weeks. Export prices have shown a slight increase. Steel bars are quoted at about £4 15s. per ton (1.05c. per lb.), compared with about £4 13s. per ton (1.43c. per lb.) about a month ago. Demand from South American markets for steel bars has increased. Exports to the United States are small, but a prominent steel producer recently said that he believed the recent decline in business with the United States is only temporary.

Business in heavy gages of sheets is active and the electrical products manufacturers are well booked with business and are large purchasers of sheets. Competition continues severe in medium and thin gage sheets. The scrap market is dull and consumers are well supplied until next year. Importation of scrap has consequently declined so that in September only about 49,000 tons was received by Germany, compared with about 81,000 tons in August.

The tube market is quiet with British competition severe and reports of increasing competition from American mills. Although the European tube industry is closely organized in the International Tube Cartel including in its membership Germany, France, Belgium, Czechoslovakia and the Polish Bismarckhuette, competition from outsiders in England and Poland has resulted in depression of prices. While German producers grant rebates to manufacturers in Germany who use tubes in products for export, the domestic market is at a high level. It is pointed out that domestic tube prices are from 55 to 62½ per cent higher than in 1913, while No. 3 foundry iron is only about 5 per cent higher, billets about 12½ per cent higher, steel bars 23½ per cent higher and heavy gage sheets 24 per cent higher than in 1913.

Tube Cartel Elimintes Competition

The high level of the tube market in Germany is attributed to the complete control exercised by the German Tube Syndicate. It was founded in 1925 and includes all makers in Germany. It has been able to exercise control over merchants and exporters and importers so as to limit imports of tubes. An agreement with the tube mills of Poland has been reached with the exception of decision as to the sales quota of Poland in certain territories. The syndicate is also negotiating with the new Niederrhein Corporation, which threatened to erect a large new tube mill in Germany. Under the proposed agreement with the Niederrhein Corporation, the syndicate will prevent competition by acquiring a majority of the stock of this company.

The Machine Manufacturers' Association in its monthly reports shows no general change in business. Foreign orders have declined slightly, but exports of machinery in September were the largest of any month since the war and were in weight only 10 per cent less than the average of 1913, which was a good year.

European Ferromanganese Makers Reach Agreement

HAMBURG, GERMANY, Nov. 12.—According to a prominent producer of ferromanganese in Germany, the recent equality of quotations by Norwegian, British and German furnaces is the result of an understanding which has finally been reached by the producers of these countries. The price level of ferromanganese, which had recently reached as low a point as £10 5s. ($49.92) per ton for export, had become disastrous, especially for makers who sell a large part of their output for export. In consequence an agreement was more easily reached than would have been possible had the market been higher.

With the recent severe competition eliminated, prices have naturally increased. The quotation on ferromanganese has already advanced about £2 ($9.75) per ton from the recent minimum, and further increases are expected. This upward movement has exercised an effect on the manganese ore market, where 1s. 6d. (37.40c.) per unit is being paid for 50 to 52 per cent ore and 1s. 4½d. (33.30c.) per unit for 48 to 50 per cent ore. There is a report which lacks confirmation that an agreement was also made among Norwegian, British and American producers concerning shipments to the United States.

FRENCH MARKET IMPROVED

Export Prices Firmer, Reflecting Slight Increase in Domestic Activity—Pig Iron Weak

PARIS, FRANCE, Nov. 18.—The slight improvement in the export market during October was reflected to a certain extent in the domestic market, which is more active and has firmer prices on some products. Were it not for the fact that an election campaign will shortly be faced and that agriculture is depressed from lack of a market, a general improvement might be expected. The few purchases that are being made now and which have caused the slight improvement in prices are from manufacturing consumers who are covering their requirements for a brief period in the belief that prices have reached as low a level as is possible.

Pig Iron.—Foundry stocks of iron are low and there has been a slight buying movement recently despite the limited business being booked by foundry consumers. In consequence stocks at blast furnaces have been somewhat reduced. At the recent meeting of the hematite iron producers, prices were maintained for December. However, as the official schedule of prices is not being maintained this should have but little effect on the market. It is noteworthy that prior to the war the difference between phosphoric pig iron and hematite iron was only 10 fr. ($1.93) per metric ton, while today it is about 160 fr. ($6.28) per ton. No definite action has been taken on renewal of the entente which includes Belgian, Luxemburg and French furnaces. Two producers, one in Luxemburg and one in Lorraine, have withdrawn, but efforts are being made to continue the entente without their participation. A decision will be necessary soon as the agreement expires Dec. 31. Should the entente be dissolved, a price war on pig iron would probably ensue.

Semi-Finished Material.—Transactions in blooms are small, but the export market seems to be reflecting the strength shown in the domestic field and prices have advanced to £3 18s. and £4 2s. ($18.98 and $19.97) per metric ton. Billets are quiet, with quotations at £4 3s. 6d. to £4 5s. 6d. ($20.33 to $20.82) per metric ton, f.o.b. Antwerp.

Finished Material.—Manufacturing consumers have been purchasing on a small scale and merchants are beginning to appear as purchasers of various products for stock. Mills are in a more independent position and concessions are less common than a few weeks ago. There has been a fair volume of export business in beams. American sections are quoted at about £4 17s. 6d. per gross ton (1.06c. per lb.) and American section angles at £4 15s. per gross ton (1.03c. per lb.), f.o.b. Antwerp. Steel bars are quoted at about £4 16s. per gross ton (1.04c. per lb.) for Thomas grade and £5 2s. per gross ton (1.11c. per lb.) for open-hearth. Structural grade reinforcing bars bring about £5 2s. per ton (1.11c. per lb.), f.o.b. Antwerp.

German Mills Reduce Size Extras

HAMBURG, GERMANY, Nov. 12.—The German Steel Syndicate (Stahlwerksverband) has made a considerable reduction in the extras on almost all bar and beam sizes, which have been higher than the French and Belgian extras for size. There has also been a revision in the extras for special qualities. The extra for copper bearing steel containing 0.25 per cent copper has been reduced to 10m. ($2.39) per ton, and the extras on bars for bolt and rivet manufacture have been reduced to 7.50m. ($1.79) per ton. The hoop manufacturers' association has reduced the extras for most of the thinner gages.

Duralumin Mine Cars Used in Germany

HAMBURG, GERMANY, Nov. 12.—The use of duralumin for small mine cars and coal baskets at collieries instead of steel is extending rapidly in Germany. It is pointed out that the cars and baskets of duralumin weigh only about one third of steel, and provide a considerable saving in power, wire rope and other materials. As many German mines are rather deep, the new type, which is acid resisting, is being introduced.

TABLE I—GERMAN PIG IRON PRODUCTION

	Number of Plants	Number of Workers	Wages Paid (1000 M.) (a)	Number of Blast Furnaces: Existing at End of Year	Number of Blast Furnaces: In Operation During Year	Operation Time in Furnace-Weeks	Consumption of Ore (d) (1000 Metric Tons)	Pig Iron Produced (1000 Metric Tons)	Value of Products (1000 M.) (a)
1913	93	42,131	67,944	376	313	15,130	37,834	16,764	1,087,923
1914	91	34,047	55,170	328	303	11,531	27,640	12,581	793,734
1915	87	26,706	44,215	326	222	10,255	23,559	10,155	749,537
1916	88	29,710	55,091	329	251	11,600	26,620	11,342	997,446
1917	88	35,724	80,255	336	272	12,634	26,147	11,622	1,537,282
1918	73	28,706	86,263	267	210	9,799	18,020	9,208	1,516,524
1919	69	33,879	186,957	232	152	6,514	10,556	5,654	2,527,760
1920	63	36,747	550,802	228	146	6,504	11,244	6,388	11,016,078
1921	66	37,125	.....	233	156	6,773	13,386	7,855	.....
1922	63	36,979	.....	209	158	7,008	15,157	9,195	.....
1923	63	33,463	.....	209	152	4,730	7,963	4,941	.....
1924	55	24,371	47,691	193	138	4,735	12,265	7,833	718,665
1925	56	23,266	58,604	200	141	5,408	16,200	10,089	879,063
1926	..	.....	.....	...	...	.....	.....	9,644 (b)	.....
1927	..	.....	.....	...	...	.....	.....	13,000 (b, c)	.....

(Data taken from Statistik des Deutschen Reichs.)
(a) 1916-1923 inflated currency; data 1921-1923 not given.
(b) Figures as furnished by Verein Deutscher Eisen und Metallindustrieller.
(c) Based on production of nine months.
(d) Includes manganese ore.

German Industry Nearing Pre-War Status

Pig Iron Within 23 Per Cent and Steel Within 6 Per Cent of 1913 Totals—Furnaces Average Larger

RECOVERY of the German iron and steel industry from the effects of the World War and of currency deflation in 1922-1923 has been especially remarkable. The display of recuperative powers of the great industries of that country is strikingly shown in a report received by the Department of Commerce from Trade Commissioner Thomas Butts, Berlin. Stripped of much of their pre-war equipment as a result of the reallocation of territory by the Treaty of Versailles, with consequent loss of productive capacity, the German industries have made an exceptional come-back and the raw steel industry has so far recovered as to approach closely the pre-war production levels.

While the greatest strength has been manifested by the German steel industry, the pig iron output also has shown distinct recuperative powers. In 1913 there were 19,309,172 metric tons of pig iron made in German blast furnaces, while in 1927, based on production of the first nine months, approximately 13,000,000 tons will be made. This amounts to nearly 70 per cent of the pre-war figure and considerably exceeds the tonnage produced in 1913 in the area of post-war Germany. After the inflation period of 1923, production in 1924 was approximately one-half that of 1913, and 1924, 1925, and 1926 all saw an increasing output. But it was not until 1927 that a decidedly sharp upward tendency was shown in pig iron production. This is particularly interesting when it is recalled that the Treaty of Versailles reduced German pig iron capacity by an estimated 43 per cent.

Another interesting factor indicative of the rationalization taking place is disclosed by Table II:

TABLE II—NUMBER AND CAPACITY OF GERMAN BLAST FURNACES

Year	Existing Furnaces	Under Operation	Daily Capacity of Existing Furnaces (Metric Tons)	Capacity per Day per Furnace
1913	376	313	.....	...
1920	232	127	35,997	155
1921	239	146	37,500	157
1922	219	147	37,600	172
1923	218	65	40,800	187
1924	215	106	43,700	203
1925	211	83	47,800	227
1926	206	109	52,300	254
1927	191	115	50,700	265

It will be noted from this table that, while the number of furnaces has decreased steadily, the capacity per furnace has been continuously mounting, largely from the replacement of many small-capacity, relatively uneconomical furnaces by large-capacity units. It is also of interest to observe that, as the production of pig iron has increased, the number of workers employed at blast furnaces has declined. The recovery of

TABLE III—GERMAN RAW STEEL PRODUCTION

	Number of Plants	Number of Workmen	Wages Paid (1000 M.) (a)	Consumption of: Pig Iron (1000 Metric Tons)	Consumption of: Scrap (1000 Metric Tons)	Production (Ingots and Castings)	Value of Products (1000 M.) (a)
1913	106	48,632	71,371	13,282	5,578	17,135	1,603,701
1914	106	36,766	61,831	10,457	4,601	13,710	1,265,011
1915	104	36,947	69,117	8,915	4,533	12,010	1,498,179
1916	112	43,703	90,754	9,997	5,630	14,240	2,116,311
1917	112	51,168	130,574	9,860	5,897	14,322	2,726,680
1918	108	48,328	150,139	7,804	5,252	11,830	2,769,173
1919	99	43,229	227,817	4,207	3,387	6,877	4,057,109
1920	102	47,186	685,913	4,998	4,218	8,383	18,468,280
1921	107	50,513	.....	6,203	4,827	9,943	.....
1922	101	50,964	.....	7,159	5,235	11,209	.....
1923	103	47,385	.....	3,739	3,131	6,208	.....
1924	103	32,590	62,318	6,371	4,278	9,703	1,057,893
1925	106	34,762	85,017	7,936	5,278	12,051	1,299,824
1926	...	.....	.....	....	....	12,341 (b)	.....
1927	...	.....	.....	....	....	16,200 (b, c)	.....

(Data taken from Statistik des Deutschen Reichs.)
(a) 1916-1923 inflated currency; data 1921-1923 not given.
(b) Figures furnished by Verein Deutscher Eisen und Metallindustrieller.
(c) Based on nine months' production.

pig iron production is graphically shown in another table. Taking the first post-war year, 1919, there were 152 blast furnaces with 33,879 workers in operation at the end of the year, with a production of 5,654,000 tons. At the end of 1925, the latest detailed figures, there were 141 furnaces operating, with 23,266 workers and a production of 10,089,000 tons.

Steel production of 1927, based on the first nine months, will total approximately 16,200,000 metric tons, an increase of 31 per cent over the 1926 figure of 12,341,636 tons. In 1913 the steel production of Germany was 17,135,000 metric tons. It is seen, therefore, that the present steel production of Germany has already attained 94 per cent of the 1913 peak, despite the loss of about one-third of the pre-war steel-making capacity.

At the beginning of 1924, after the period of inflation, German steel production was approximately 55 per cent of the 1913 production. During 1924 and 1925 there was a steady increase in about the same ratio as the increase in the pig iron production, although during 1926 steel production showed no increase. In 1927, however, there was a marked improvement.

Another table shows the growth of the German steel industry before, during and since the war. For 1913 the table shows 106 plants with 48,632 workers, and a production of 17,135,000 metric tons. For 1917 the number of plants shown is 112 with 51,168 workers and an output of 14,322,000 metric tons; while for 1925 the number of plants is 106, with 34,762 workers and an output of 12,051,000 tons. The latter year shows a much greater output per man, although a decline in the total output.

Iron and Steel Employment Falls Off

There was a decline of 1.2 per cent in the number of men on the payroll in 206 identical establishments in the iron and steel industry, from September to October, according to a report of the United States Bureau of Labor Statistics. The numbers were respectively 295,934 and 256,791. Accompanying this decrease in number was a slight increase in the total payroll, which, for one week in the two months, advanced from $7,515,339 to $7,534,122, or a gain of 0.2 per cent.

There was a decline of 2 per cent in the number of men in the general classification of foundry and machine shop products. Here 966 establishments reported 225,411 men in September and 220,992 in October. The decline in payroll at 1.2 per cent was less than that in numbers. For one week in September the payroll was $6,457,073, declining in October to $6,379,169. In 150 machine tool establishments there was a decline of 0.2 per cent, both in employees and in payroll.

Great Increase in Electric Power

American industry is electrified to the extent of 73 per cent of the total primary power equipment in manufacturing, according to the National Industrial Conference Board. The amount of such equipment in our industries nearly trebled between 1915 and 1925, reaching in 1925 a total of 26,123,573 hp. Germany, with 63 per cent electrification, was reported in second position, while Great Britain had only 48 per cent of her industries electrified.

During the years 1914 to 1919, the increase in electric power in American industry was 83.6 per cent. This represented an annual increment average of 13 per cent. From 1919 to 1925 electric power consumption increased at an average of about 8 per cent a year. Total industrial horsepower in 1925 was given as 35,772,628.

Manufacture and Use of High Strength Structural Steel

In the report of A. V. deForest's address on the manufacture of wire for suspension cable, contained on page 1390, THE IRON AGE for Nov. 17, a misstatement is made that the ultimate strength of the rod after patenting is 60,000 to 80,000 lb. per sq. in. Those figures are for the rolled rod in the annealed state. Mr. deForest said that the ultimate strength after patenting is usually between 130,000 and 160,000 lb. per sq. in.

FOUNDRY EQUIPMENT INDEX

Shows Gain for October—Separate Indices Kept for Large and Small Orders

The Foundry Equipment Manufacturers Association has prepared indices of orders and shipments based on average monthly shipments for the years 1922-1923-1924. The index of orders for the month of October was 98, as compared with 80.4 in September. The index of shipments was 113.4 and of unfilled orders, 106.3. The three-months average of gross orders, as of Nov. 1, was 94.9. In addition separate indices are kept for orders of $10,000 each and above and orders of less than $10,000.

INDEX OF FOUNDRY EQUIPMENT ORDERS
OCTOBER, 1927

	*Index A	*Index B	*Total
Number of reports	10	8	18
Gross orders—for month	95.8	131.1	98.0
Cancellations	0.1	0.4	0.1
Net orders	95.7	130.7	97.9
Shipments	114.1	106.8	113.4
Unfilled orders	109.2	58.4	106.3
Three months' average of gross orders	93.5	116.2	94.9

*Note: Index A—Base $10,000 and above. Index B—Base less than $10,000. Base—Average monthly shipments for years 1922-23-24. Totals—The total of all reports is not an average of A and B, but represents the total sum of each item in percentage of the total base.

INDEX OF GROSS ORDERS SINCE JANUARY, 1921
Base: Average monthly shipments for 1922-23-24.

	1921	1922	1923	1924	1925	1926	1927
Jan.	30.9	44.5	157.3	141.8	104.2	168.2	180.4
Feb.	34.5	37.0	143.6	121.0	108.8	154.9	198.0
March	39.3	94.0	160.8	121.9	159.3	157.3	131.1
April	31.0	93.0	151.9	146.8	124.3	113.2	130.0
May	41.9	124.4	174.6	108.4	113.3	128.5	134.8
June	25.7	131.5	141.8	96.4	110.5	133.5	138.4
July	50.5	87.6	118.4	62.8	117.0	127.3	89.9
Aug.	22.7	114.1	119.0	77.5	190.0	141.2	106.4
Sept.	38.7	72.8	78.0	66.0	94.2	114.0	80.4
Oct.	42.5	107.3	115.1	85.5	149.5	140.5	98.0
Nov.	37.1	98.8	91.5	91.0	180.3	133.4	....
Dec.	33.4	112.0	138.4	137.8	140.1	181.0	....

Increased Bookings of Fabricated Steel Plate

Bookings of fabricated steel plate in October are reported by the Department of Commerce at 41,478 tons, an increase of more than 7 per cent over the September total of 38,662 tons. The October figure, however, was almost 8 per cent below that of a year ago, with bookings amounting to 44,974 tons. For the ten months there has been an increase of 2 per cent over last year, with 429,096 tons against 420,936 tons.

October tonnage included 18,098 for oil storage tanks, 1599 for refinery materials and equipment, 6707 for tank cars, 3252 for gas holders, 385 for blast furnaces and 11,437 for stacks and miscellaneous. The tonnage for tank cars was the highest for any month in two years; that for blast furnaces was, with one exception, the lowest in 18 months; that for refinery materials was, with one exception, the lowest in two years.

Bookings for October were 51.3 per cent of monthly capacity, compared with 47.8 per cent in the preceding month and with 56.5 per cent a year ago. For the first ten months bookings have averaged 53.3 per cent, compared with 51.4 per cent last year.

Steel Furniture Orders Behind Last Year

New orders for steel furniture in October are reported by the Department of Commerce at $2,410,552, compared with $2,614,780 a year ago. Shipments in October were $2,379,557, against $2,552,997 a year ago. For the ten months the total this year was $25,433,799 in orders, against $25,987,694 last year, showing a slight falling off. The October figures in both headings were a little better than in September. Unfilled orders at the end of October were for about 17 days' production at the October rate.

Steel shelving orders in October are reported at $551,259. This compares with $591,652 a year ago and with $607,905 in September. For the ten months the total of $6,157,083 was less than 1 per cent under last year's ten-month total.

Welded Steel for Motor Frames

(*Concluded from page* 1508)

rolled steel into the equivalent of a rough casting for less than the casting would cost. For the plant which owns its own foundry the problem is one of making the equivalent of the casting for less labor and overhead cost by welding together pieces of hot rolled steel, than to make patterns, and mold and cast the pig iron into a predetermined shape.

Total Labor Decreased

Since the Lincoln Electric Co. does not operate a foundry, it is evident that our own labor costs increased when we started fabricating the equivalent of castings in our own plant. It is probably true, however, that the total labor actually decreased. When we bought the castings from a jobbing foundry we were paying on the average 6c. per pound for the castings. Certainly a large proportion of the difference between foundry pig iron at 1c. per pound and the rough casting at 6c. per pound was labor which had been expended by the job-

Reduction in Inventory by Use of Welded Steel Construction for Motor Frames

Frame Designation	Stock Quantity	Cast Iron — Cost Each	Cast Iron — Value	Steel — Cost Each	Steel — Value
100 Series	4,000	$0.89	$3,560	$0.67	$2,680
200 Series	3,000	1.61	4,830	1.08	3,240
300 Series	3,000	3.16	9,480	1.70	5,100
400 Series	500	16.72	8,360	5.50	2,750
500 and 600 Series..	250	41.34	10,335	21.15	5,287
			$36,565		$19,057

bing foundry. We were paying for labor in the castings as truly as if the men were on our own payroll, in spite of the fact that our accounting system showed only an expenditure for "material" when we bought the castings, and our principal labor was subsequent machining operations.

Inventory, Engineering and Tool Room Expense

Our overhead expense as a whole has been reduced as a result of using welded steel construction. "Material in process" may be cited to show the effect. The tabulation shows the difference in inventory on the same number of frame castings and of the welded steel pieces held in stock. This excess inventory on the castings has to be carried from the time they are placed in the parts stock until the title finally passes to the purchaser. The same situation exists to a varying degree on all the other parts which go to make up the product. It is evident that less capital is required to operate our business, and that represents a reduction in overhead expense.

Other measurable items of overhead which have been effected are drafting room expense, tool room expense, pattern expense. Drafting room expense is 30 to 40 per cent less with welded steel, owing to the simplification of shapes with the steel practice.

Tool room expense increased slightly when we introduced welded steel, due to the necessity of making dies to cut and shape steel received from the mill. There are a few welding fixtures also made in the tool room which have added to the tool room expense. To balance this, the tool room has learned a great deal about building special production machines and equipment. Before we went into production welding, the tool room had accumulated nearly 2500 patterns which had been used only once or twice for making special machines or to make repairs on old machines. In the last four years the tool room has bought less than 200 patterns of this sort; it makes new machines and repairs in steel. While we do not know whether the tool room expense has increased or decreased as a result of using welded steel in place of castings, we think that it has remained about the same.

Supervision of the assembly of welded steel parts is an item we expected to be very high. Actually we have not been able to find any increase. The welding operators get the material cut to size and ready to weld. They also get the assembly drawing and the fixture, if one is required. After a few months' employment the operators fabricate nearly any job that comes to them, without assistance from the foreman or the engineering department. Sometimes, however, as when building a special automatic welder, an engineer will stay with the operator until he is sure the job is going right. The engineer would probably do the same thing if we were using castings, only in that case the engineer would spend the time with the foreman of the machine shop.

Total Costs Reduced

To summarize the results which have been obtained up to the present time in the application of arc welding to our product, we may state the essential facts as follows:

1. It has taken from 1921 to 1927 to replace slightly more than 85 per cent of the castings we formerly used with welded steel construction.

2. The average cost of the welded steel parts used in place of castings is about 40 per cent of the price of castings if bought today.

3. We set out to beat our competitor's costs by a different method of manufacture, and with sales showing a steady increase we are sure we have done what we set out to do.

Concentrating Alabama Ores and Flue Dusts

In order to anticipate the exhaustion of the present high grade ores mined near Birmingham, Ala., the United States Bureau of Mines has since July, 1923, studied the concentration of the red sandstones in that vicinity. Results are reported in Bulletin No. 278 by Oscar Lee, B. W. Gandrud and F. D. De Vaney.

Laboratory tests led to others on semi-commercial scale, where good recoveries were made by the following procedure: (a) Roast the crushed ore in a Herreshoff furnace, the two lower hearths of which have an atmosphere of by-product gas. (b) Quench the hot calcine; separate fines in a hydraulic classifier. (c) Grind the coarse particles in a ball mill. (d) Thicken the product. (e) Pass pulp through two or three log washers with magnetized bottom plates. (f) Recover lime from tailing in a flotation cell. (g) Sinter magnetic concentrate, lime and coke mixture on Dwight-Lloyd machine.

Self fluxing sinter made from low grade red ores originally containing 35 per cent iron will assay about 50 per cent iron; 40 per cent gray ore will make 60 per cent sinter. In each case over 90 per cent of the iron is recovered.

Alabama blast furnaces make about 300,000 tons of flue dust a year which is too high in carbon and gangue for sintering direct. It is a quite variable product, often containing the iron in magnetic form. In this shape it can be treated immediately on a magnetic dry concentrator. Wet treatment similar to that outlined above for ore will recover 85 per cent of the value in a sinter containing 50 per cent iron.

Estimates of costs when operating on tonnage basis are not given in the bulletin.

Production of bituminous coal in the week ended Nov. 19 advanced to 9,945,000 net tons from 9,454,000 tons in the preceding week, according to figures of the United States Bureau of Mines. For the calendar year to Nov. 19 the total was 464,597,000 net tons. This is about 7 per cent under the corresponding period in 1926, when there was no direct strike. It is, however, considerably in excess of both 1924 and 1925.

Three more interesting leaflets have been issued by the Lebanon Steel Foundry, Lebanon, Pa., in its series dealing with the story of the Lebanon electric furnace steel castings. No. 15 deals with the cleaning department, No. 16 with heat treatment, and No. 17 covers inspection. Each one is fully illustrated.

Machinery Exports Drop Further

Ten-Month Total Is Nearly 8 Per Cent Above 1926—Imports This Year Up 14 Per Cent

WASHINGTON, Nov. 28.—Making a small further decrease, exports of machinery of all kinds in October were valued at $33,995,216, against $34,289,038 in September and $41,018,828 in August. For the ten months ended with October they were valued at $360,569,170, an increase in excess of $25,000,000 over exports for the corresponding period one year ago. Exports of industrial machinery, as classified by the Division of Statistics, Department of Commerce, were valued at $16,733,510 in October, a gain of more than $2,000,000 over September. For the same month last year the value was $13,227,892. For the ten-month periods of 1927 and 1926 the values were $167,142,121 and $147,740,992 respectively.

Exports of power-driven metal-working machinery in October were valued at $1,913,198, against $1,554,732 in September and $1,069,343 in October, 1926. For the ten-month periods of the current and last year the values were $15,660,970 and $11,839,180 respectively. A comparison of the trade during October with October of last year shows gains in all of the major classes of industrial machinery. Exports of power-driven metal-working machinery as listed by THE IRON AGE numbered 782, valued at $1,084,961, in October, against 510, valued at $953,084, in September.

Total imports of machinery and vehicles in October were valued at $2,234,168, against $2,089,542 in October of last year. For the ten-month periods the values were $23,337,431 and $22,065,056 respectively. Imports of industrial, office and printing machinery in October were valued at $1,298,694, against $1,359,829, and for the ten months ended with October the value was $13,996,093, against $13,855,308 for the corresponding period of 1926. As listed in THE IRON AGE table, imports of machinery in October were valued at $1,495,195, compared with $1,165,386 in September and $1,450,597 in October of last year. For the ten months ended with October the value was $16,683,823, against $14,793,907 for the corresponding period of last year.

Exports of agricultural machinery and implements showed a sharp but seasonal decline to $5,902,650 in October, as against $8,690,000 in September, but for the ten months of the present year they aggregated $78,358,654, compared with $76,116,353 for the corresponding period of last year. The Agricultural Division pointed out that while exports for the ten months of the present year were greater than shipments during 1925, they do not necessarily presage an increase for the calendar year 1927 over 1926, as the past year was characterized by fairly large shipments in the last two months of the year, which brought the total to $85,666,573. Shipments of tractors during the ten months of 1927 showed a large increase over exports during the corresponding period of 1926.

Exports of Power-Driven Metal-Working Machinery

	October, 1927		September, 1927	
	No.	Value	No.	Value
Engine lathes	77	$114,299	38	$103,228
Turret lathes	12	56,916	15	33,855
Other lathes	28	68,218	25	156,174
Vertical boring mills and chucking machines	5	6,198	11	19,792
Thread-cutting and automatic screw machines	121	150,069	47	47,298
Knee and column-type milling machines	35	48,629	5	11,842
Other milling machines	45	56,982	37	101,300
Gear-cutting machines	31	70,104	29	100,830
Vertical drilling machines	33	50,672	15	20,471
Radial drilling machines	17	26,629	8	15,462
Sensitive drilling machines	28	1,032	75	2,166
Other drilling machines	55	95,773	27	10,082
Shapers and slotters	26	57,837	23	43,238
Planers	2	4,116	6	20,041
External cylindrical grinding machines	68	142,140	66	132,609
Internal grinding machines	50	106,554	46	110,101
Metal-working tool-sharpening machines	149	28,793	37	24,595
Total	782	$1,084,961	510	$953,084

Imports of Machinery into the United States

	October		Ten Months Ended October	
	1927	1926	1927	1926
Metal-working machine tools	$31,206	$32,572	$359,346	$364,369
Agricultural machinery and implements	427,496	258,212	4,809,454	4,340,570
Electrical machinery and apparatus	250,806	258,845	2,500,248	707,914
Other power-generating machinery	305	187	9,031	5,794
Other machinery	528,210	688,124	6,974,108	7,552,690
Vehicles, except agricultural	257,172	212,657	2,031,636	1,822,570
Total	$1,495,195	$1,450,597	$16,683,823	$14,793,907

Machinery Exports from the United States

(By Value, in Thousands of Dollars)

	October		Ten Months Ended October	
	1927	1926	1927	1926
Locomotives	$175	$267	$4,584	$4,790
Other steam engines	93	110	1,185	1,206
Boilers	94	127	1,560	1,395
Accessories and parts	126	212	553	1,524
Automobile engines	632	922	10,154	11,684
Other internal combustion engines	550	485	6,052	7,674
Accessories and parts	198	265	2,829	3,600
Electric locomotives	208	268	1,029	2,331
Other electric machinery and apparatus	501	616	6,185	6,103
Excavating machinery	404	375	4,010	3,734
Concrete mixers	83	64	965	632
Road making machinery	104	113	1,807	1,507
Elevators and elevator machinery	477	463	4,123	4,361
Mining and quarrying machinery	1,155	892	11,282	12,561
Oil well machinery	1,201	948	15,064	12,016
Pumps	512	408	6,313	5,014
Metal-working machinery and parts*	1,868	1,126	15,505	11,468
Textile machinery	926	633	9,285	8,621
Sewing machines	697	771	7,492	7,210
Shoe machinery	128	99	1,372	1,112
Flour-mill and gristmill machinery	64	81	464	755
Sugar-mill machinery	1,162	539	4,390	3,212
Paper and pulp-mill machinery	356	582	3,222	2,776
Sawmill machinery	78	56	675	832
Other woodworking machinery	115	59	1,170	984
Refrigerating and ice-making machinery	402	384	6,386	3,950
Air compressors	432	342	4,916	3,911
Typewriters	1,381	1,419	16,793	15,247
Power laundry machinery	103	73	1,300	1,136
Typesetting machines	408	253	3,655	3,172
Printing presses	462	387	5,135	5,323
Agricultural machinery and implements	5,903	3,603	78,359	76,116
All other machinery and parts	12,996	10,892	122,757	109,237
Total	$33,995	$27,834	$360,569	$335,193

*Details of principal items in another table.

Machinery Markets and News of the Works

BUYING NO MORE ACTIVE

Machine Tool Business Shows Little or No Improvement

November Sales May Not Equal Those of October—Volume for Year So Far Is 70 to 75 Per Cent of 1926

MACHINE tool buying has been no more active in the past week, and indications now point more definitely to the probability that the volume for November will in most cases fall below that of October. Some manufacturers have booked more orders this month than last, but they are the exceptions. Based on the sales figures for 11 months, it is indicated that the total sales for 1927 will approximate only 70 to 75 per cent of the 1926 volume.

Neither automobile companies nor the railroads, to which the trade looks for a good share of its business, are active buyers. Sales to these classes of buyers are not so important as those to companies in the general industrial field. While many prospective purchasers are delaying action on recent inquiries until the trend of general business is more definitely established, others are placing orders for delivery after Jan. 1 with the apparent expectation that greater industrial activity may be expected early in the new year.

Meanwhile, operations are on a curtailed basis at most of the machine tool plants. Some in the trade look for no definite upward trend within the next 60 days.

New York

NEW YORK, Nov. 29.

THE spotty character of business is indicated by the fact that some local selling offices report November business better than October, while with others the trend has been slightly downward. Some orders are being placed for delivery after Jan. 1, but a good many prospective buyers are still delaying action on inquiries because of the uncertainties of the general business situation. Among the week's purchases were the following: One used Potter & Johnson shaper, one used No. 24 Aurora drill and one used 14-in. vertical surface grinder by a Boston company; one used No. 2 Pratt & Whitney hand screw machine by a company at New Britain, Conn.; a hob and cutter grinder by a company at Salem, Ohio; a die sinking machine by a drop forge company in Ohio; a 6-in. thread milling machine by a Milwaukee company; a jig borer by another Milwaukee company; a four-spindle mud-ring drill by the Chicago, Minneapolis, St. Paul & Omaha Railroad; a four-spindle drum-type milling machine by a motor company in Detroit.

The Chevrolet Motor Co., Broadway and Fifty-seventh Street, New York, has plans for a three-story top addition to its service and repair plant at Fifty-sixth Street and Eleventh Avenue, to cost more than $200,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect. The main plant of the company is at Flint, Mich.

The General Bronze Corporation, Long Island City, has been organized to take over and consolidate the John Polachek Bronze & Iron Co., 480 Hancock Street, and the Renaissance Bronze & Iron Works, foot of Foster Avenue, both Long Island City. The new company is said to have assets of more than $5,000,000. It is proposed to continue both plants under the new name, and an expansion program will be carried out. The Polachek company has recently been making enlargements in its plant. John Polachek will head the new organization.

The Kings County Refrigerating Co., 24 Hall Street, Brooklyn, has plans for a new four-story cold storage and refrigerating plant, to cost in excess of $70,000 with equipment. J. G. Grover, 2772 Ocean Avenue, is architect.

The International Paper Co., 100 East Forty-second Street, New York, has arranged for the purchase of about 1000 acres of timber property on the Restigoughe River, New Brunswick, as a site for a new paper and pulp mill. The plant will have a capacity of 200 tons of finished stock per day, and is reported to cost more than $1,500,000 with machinery. A transmission line will be built for mill service. It is proposed to begin work early next year.

Fire, Nov. 18, destroyed the three-story factory at 603-11 Dean Street, Brooklyn, occupied jointly by the Metal Lamp Co., the Home Utility Mfg. Co., and the Townsend Automatic Machine Co., with combined loss estimated at close to $100,000 including equipment. The three companies plan to replace their factories.

The Bee Line, Inc., 49-51 165th Street, Jamaica, L. I., operating an automobile bus line, has plans for a two-story service, repair and garage building at Rockville Center, L. I., to cost about $200,000 with equipment. Harry Harvie, 15 Hillside Avenue, Rockville Center, is architect.

The Missouri-Kansas Zinc Co., room 823, 25 Broad Street, New York, is completing plans for the construction of a tailings mill and flotation plant at its properties in Missouri, to cost close to $100,000 with machinery. The company is arranging for the sale of a block of about 10,000 shares of stock, a portion of the fund to be used for this and other expansion.

The Mohawk & Hudson Power Corporation, Albany, N. Y., is concluding negotiations for the purchase of the Schodack Light & Power Corporation, operating at Schodack, Castleton and vicinity, and will consolidate with its organization. Plans are under way for expansion in the Schodack district, including transmission lines.

The Yonkers Plumbing Supply Co., Yonkers, N. Y., has approved plans for a new one-story storage and distributing plant, with pipe and pipe-cutting departments, etc., at Mount Vernon, N. Y., to be 80 x 100 ft., and to cost about $21,000 with equipment. G. W. Kibitz, 410 East Tremont Avenue, New York, is architect.

The Wright Aeronautical Corporation, 233 Lewis Street, Paterson, N. J., has awarded a general contract to the John W. Ferguson Co., 152 Market Street, for a one-story addition, 100 x 100 ft., to be equipped primarily as an assembling works. It will cost about $200,000 with machinery.

Huff Airplanes, Inc., Pardee tract, Market and Herbert Streets, Perth Amboy, N. J., recently organized, will soon receive bids for its new aircraft plant on 14-acre tract recently acquired. The works will consist of four buildings, three of the structures will be those formerly used by the Pardee Steel Works and will be remodeled; the fourth will be a new unit on adjoining site, aggregating about 75,000 sq. ft. of floor space, to be equipped for assembling. The other departments will include a sheet-metal shop, including riveting department, machine shop, and fuselage department for the fabricating of tubular frames, etc., totaling about 84,000 sq. ft., in all. A power plant and engineering department will be provided. The entire plant will cost in excess of $150,000. Thomas H. Huff is president.

Kelly & Co., Inc., 780 Frelinghuysen Avenue, Newark, N. J., manufacturer of paper-makers' equipment and supplies,

The Crane Market

VERY little new inquiry for overhead and locomotive cranes has appeared in the past week. There is, however, a fair volume of pending business. The pillar-type crane for the Interborough Rapid Transit Co. yards at 149th Street, New York, may not be closed for some time. In the overhead field, the 13 cranes for the West Philadelphia plant of the General Electric Co. are still pending and the lumber handling cranes for the Franklin Lumber Co., Newark, N. J., have not yet been awarded. The list of about 40 overhead cranes of various capacities to be bought by the Transit Commission, New York, for the 207th Street subway yards is not expected to come up for bids until next year. The Phoenix Utility Co., 71 Broadway, New York, is reported to be preparing an inquiry for a 150-ton overhead crane with two 75-ton trolleys. In the New England district several power house cranes are reported to be under inquiry and will probably be purchased before Jan. 1.

Among recent purchases are:

Heintz Mfg. Co., Philadelphia, a 10-ton, 36-ft. 6-in. span, electric overhead crane from the Niles Crane Corporation.

Martin Schmick, Greenwood Lake, N. Y., a 7½-ton crawl-tread locomotive crane from the Browning Crane Co.

Clinton Bridge Co., Clinton, Iowa, six 1-ton hand power cranes from H. D. Conkey & Co.

has awarded a general contract to Robert Allen, Inc., 319 Mount Pleasant Avenue, for a one-story addition, to cost about $55,000 with equipment. George E. Jones, 24 Commerce Street, is architect.

The Public Service Electric & Gas Corporation, Public Service Terminal, Newark, N. J., has arranged for a new bond issue of $45,000,000, a portion of the fund to be used for extensions and improvements.

The Township of Teaneck Board of Education, Teaneck, N. J., plans the installation of manual training equipment in a three-story high school on the Queen Anne Road, to cost $700,000, for which bids are being asked on general contract until Dec. 6. Hacker & Hacker, Fort Lee Trust Building, Fort Lee, N. J., are architects.

Horace G. Fowler, Creek Road, Keansburg, N. J., has plans under way for a two-story addition to his ice-manufacturing plant, to cost close to $35,000 with equipment.

The Gilby Wire Co., 123 Jackson Street, Newark, manufacturer of wire and cables, nickel-chromium castings, etc., has concluded arrangements for the purchase of the plant of the F. N. Du Bois Co., 162 Riverside Avenue, manufacturer of plumbing equipment. It consists of a group of one-story units, totaling 30,000 sq. ft. of floor space, on 3-acre site, all of which will be used by the purchasing company. The sale includes considerable plant equipment, a portion of which will be retained, and the remainder sold. The new owner will remove its present business to the new location early in January. Wilbur B. Driver, formerly vice-president of the Driver-Harris Co., Harrison, N. J., and Walter Gilby head the new organization.

The Household Institute, Inc., 19 Madison Avenue, New York, has been organized to manufacture die-cast aluminum cooking utensils. Contracts for materials and equipment have been placed and the company is engaged in the manufacture of tools and dies, preparatory to placing its products on the market in February.

Philadelphia

PHILADELPHIA, Nov. 28.

THE Quaker City Cold Storage Co., Water and Spruce Streets, Philadelphia, will soon ask bids on a general contract for a new eleven-story cold storage and refrigerating plant, to cost close to $1,000,000 with equipment. The Ballinger Co., 105 South Twelfth Street, is architect and engineer.

Andrew Blum, 25 East Price Street, Philadelphia, manufacturer of automobile bodies, wagon equipment, etc., has awarded a general contract to John Roman, Philadelphia, for a one-story addition. Robert L. Gill, 5600 Germantown Avenue, is architect.

Revised plans have been drawn for the three-story addition, 60 x 140 ft., at the plant of H. H. Ward, Fourth and Eagle Streets, Chester, Pa., manufacturer of cornices, ceilings and other sheet metal products, and new bids on general contract will be taken at once. It will cost more than $75,000 with equipment. The Ballinger Co., 105 South Twelfth Street, Philadelphia, is architect and engineer.

Air-conditioning equipment, automatic machinery, conveying and other apparatus will be installed in the new eight-story factory addition to be erected at the tobacco plant of Bayuk Cigars, Inc., Ninth Street and Columbia Avenue, Philadelphia, estimated to cost in excess of $500,000 with equipment.

The Campbell Soup Co., Front Street, Camden, N. J., will take bids at once for a new plant on a 22-acre tract at Chicago, consisting of two units, six stories and basement, 240 x 340 ft., and two stories and basement, 100 x 200 ft., to cost approximately $1,000,000 with equipment. The plant will include a power house, machine shop and other mechanical departments. Battey & Kipp, 231 South La Salle Street, Chicago, are architects and engineers. Arthur C. Dorrance is general manager, in charge.

The Board of Education, Pleasantville, N. J., has been authorized to issue bonds in amount of $600,000 for a three-story and basement high school. It is planned to install manual training equipment. Bids will soon be asked on a general contract. S. H. Vaughn, Guarantee Trust Building, Atlantic City, N. J., is architect.

The Lehigh-Bernstein Mfg. Corporation, Allentown, Pa., manufacturer of metal beds, springs, etc., has leased the building at 747 West Pratt Street, Baltimore, totaling about 8000 sq. ft. of floor space, for a new factory branch and distributing plant.

Officials of the Metropolitan Edison Co., Reading, Pa., are organizing three subsidiary companies, the McNett Township, McIntyre Township and Lewis Township Power companies, to construct and operate transmission lines in the different districts for which named, all in Lycoming County. It is purposed to begin work as soon as permission is granted.

The Board of Education, Glassboro, N. J., is considering the installation of manual training equipment in a three-story senior high school to cost about $500,000, for which it is expected to ask bids soon on a general contract. Ritter & Shay, Packard Building, Philadelphia, are architects.

The J. Frank Darling Co., Wilmington, Del., manufacturer of hard surface flooring, has completed the erection of a local plant on a 24-acre tract, and proposes to develop maximum production at an early date. The company is concluding the sale of a bond issue of $1,000,000, a portion of the fund to be used for operations and development.

The J. L. Turner Brick Co., Mifflinville, Pa., is planning to rebuild its plant destroyed by fire several weeks ago, with loss reported upward of $75,000 including equipment. It is purposed to have the works ready for service early in the spring. A boiler house, mechanical-handling equipment and other machinery will be installed.

Thomas Hart, Miners' Bank Building, Wilkes-Barre, Pa., is at the head of a project to construct and operate a local multi-story automobile service, repair and garage building, estimated to cost more than $400,000 with equipment. A company will be organized by Mr. Hart and associates to carry out the enterprise.

Officials of the Pennsylvania Power & Light Co., Allentown, Pa., have applied for permission to form a group of nine subsidiary companies to operate in Juniata, Snyder, Northumberland and Perry Counties. Each of the new interests will build transmission lines to be linked with the system of the parent company, with stations and facilities for commercial service.

Karl Lieberknecht, Inc., Oberlungwitz, Saxony, Germany, manufacturer of knitting machinery and parts, represented by George B. Eves, Reading, Pa., attorney, has begun the erection of a one-story plant, 150 x 350 ft., at Rosedale, near Reading, as an American branch for the manufacture of a line of knitting and textile mill machinery. The initial unit is estimated to cost more than $75,000 with equipment. An American company is being formed to carry out the project, to be headed by Karl Richard Lieberknecht of the German interest; W. C. Bitting, president and manager Rosedale Knitting Co., Rosedale, with mill near the new plant, and F. L. Chipman, vice-president Chipman Knitting Mills, Inc., Easton, Pa. Following the operation of the first plant, it is proposed to establish other units.

The Harrisburg Mfg. & Boiler Co., Harrisburg, Pa., has developed a new type of snow-loading machine and expects to devote a considerable portion of the plant to the production of this equipment; another line of manufacture will be a new traveling oven, recently perfected by the company.

The Non-Pareil Die Corporation, Copewood Street, Camden, N. J., has been organized to take over the plant and business of the Non-Pareil Die Co., which has operated for the past four years as a manufacturer of threading dies for pipe, bolt and casing machines. Expansion is planned, but it does not include construction of new buildings.

Buffalo

BUFFALO, Nov. 28.

PLANS have been filed by the Huron Portland Cement Co., Hamburg Turnpike, Buffalo, for a one-story addition to cost about $140,000, for which superstructure will be placed under way at once.

The Aluminum Co. of America, Inc., Oliver Building, Pittsburgh, has arranged for the removal of an experimental plant for the production of aluminum shingles at New Kensington, Pa., to the works of its subsidiary, the United States Aluminum Co., 2050 Elmwood Avenue, Buffalo, where the manufacture of this product will be concentrated in the future.

The Buffalo, Niagara & Eastern Power Corporation, Buffalo, is arranging for a stock issue to total $10,500,000, a portion of the proceeds to be used for extensions and betterments in power plants and system.

The Board of Education, Watertown, N. Y., plans the installation of manual training equipment in a junior high school to cost upward of $200,000, for which plans are being prepared by Lansing & Green, Sherman Trust Building, architects.

The Corhart Refractories Co., an interest of the Corning Glass Co., Corning, N. Y., recently formed to manufacture special refractory materials, has awarded a general contract to the L. W. Hancock Co., Louisville Trust Building, Louisville, Ky., for the initial unit of its plant at Louisville, to be two stories, and to cost about $175,000 with equipment. Louisville offices have been opened in the Starks Building.

The Buffalo General Electric Co., Electric Building, Buffalo, will soon begin superstructure for an addition to its steam-operated electric generating plant, to cost upward of $1,000,000 with equipment.

The Kent Co., Inc., 523 Dominick Street, Rome, N. Y., manufacturer of vacuum cleaners and floor polishing machines, etc., has purchased two buildings on Canal Street from the Rome Brass & Copper Co. Possession will be given on Jan. 1 and the business will be removed to the new location.

The Enduro Mfg. Co., Inc., 14 Franklin Street, Rochester, N. Y., has been organized to manufacture the Duroflex telephone bracket in cast iron and aluminum. The company will use aluminum and iron castings, aluminum and steel rods in needle bar quality, threaded pins of needle bar steel and brass cap nuts and washers made true to size in nickeled steel and fiber. Requirements for the next several months have been covered. The company is doing its own manufacturing aside from castings.

Pittsburgh

PITTSBURGH, Nov. 28.

MACHINE tool orders do not total large in a monetary way, but are fairly numerous. The general report, however, is that business is dull. November was not so good a month as October in sales or returns and few expect December to show much improvement, except in the way of inquiries, preliminary to early 1928 requirements. Builders of rolling mills are getting a fair amount of work, but manufacturers of electrical equipment are not very busy.

The Pittsburgh Coal Co., Oliver Building, Pittsburgh, will erect three one-story shops at its property at Houston, Washington County, Pa., one 40 x 80 ft., and two 40 x 60 ft., to cost close to $45,000 with equipment.

The Etna Forge & Bolt Co., Commonwealth Building, Pittsburgh, has plans for a one-story addition, 50 x 180 ft., to its mill at Etna, Pa., to cost more than $60,000 with equipment. It is purposed to begin work early next year.

The Board of Education, Montgomery, W. Va., is said to be planning the installation of manual training equipment in a new high school to cost $175,000, for which bids have been asked on a general contract. Wysong & Bengston, Professional Building, Charleston, W. Va., are architects.

The H. J. Heinz Co., 1062 Progress Street, Northside, Pittsburgh, manufacturer of canned foods, will erect a new two-story plant at Berkeley, Cal., 200 x 760 ft., to cost close to $1,000,000 with equipment. The project will include a power house, machine shop and other mechanical departments. The Austin Co., San Francisco, is engineer. The Heinz company has filed plans at Pittsburgh for a five-story addition to its local storage and distributing plant, to cost approximately $50,000.

The F. A. Frishkorn Co., Zelienople, Pa., has awarded a general contract to Edward Oestermine, local, for a new two-story tin and metal-working shop, to cost about $25,000 with equipment.

The Columbia Radiator Co., McKeesport, Pa., has filed plans for a one-story addition, 72 x 200 ft., to cost close to $60,000 with equipment.

The Glassport School District, Glassport, Pa., has acquired a two-acre tract bounded by Ohio, Erie, Second and Third Streets, as site for a new junior high school, with manual training department, to cost $200,000. H. C. Clepper, Century Building, Pittsburgh, is architect.

The Liquo-Gas Co., 234 East Eighth Street, Erie, Pa., has been incorporated to manufacture ranges, hot plates and hot water heaters adapted to the use of a liquefied petroleum gas which the company supplies in tanks for use in homes where no pipe gas is available. Manufacturing contracts have been let for the next six months.

The Freeport Steel Products Co., Freeport, Pa., has been formed to succeed the Freeport Mfg. Co., and will continue the manufacture of flat sheets and expanded metal lath in the plant formerly operated by the old company.

New England

BOSTON, Nov. 28.

THE machine tool trade, generally, is dull. Inquiries are rare, and for the most part consist of single used tools, involving little money. There are numerous old inquiries, however, which the trade considers active, but will probably not be closed until after Dec. 31, unless dealers are willing to sell on an extended bill of dating. New prices on various types of machine tools show an advance approximating 10 per cent, to conform with new lists issued by manufacturers.

Small tool sales have dropped again and the turnover for the current week gives indication of being the smallest for any similar period in several months.

New England machine tool builders, collectively, have fewer unfilled orders on their books than a month ago. Two bright spots are the Brown & Sharpe Mfg. Co., Providence, R. I., and Pratt & Whitney Co., Hartford, Conn. The Pratt & Whitney Co. has sufficient orders booked to keep the plant operating on its present schedule for some time. It is believed that Vermont firms which recently suffered losses by flood will be back on a normal operating basis much sooner than was at first expected.

H. C. Hunter, Tidewater Oil Sales Corporation, 11 Broadway, New York, has completed plans for a one-story, 33 x 47 ft., pump house and other improvements in New Bedford, Mass., for the company.

C. R. Makepeace, 907 Grosvenor Building, Providence, R. I., is preparing plans for a manufacturing plant for the Jewelers Supply Co., 37 Garnet Street, that city.

William M. Haines, 32 Riverview Avenue, Waltham, Mass., architect, has completed plans for a two-story, 60 x 100 ft., automobile showroom, office and repair shop for Thomas Sullivan, 385 Main Street. Some mechanical equipment is required.

The Malden Electric Co., 139 Pleasant Street, Malden, Mass., has awarded contract for a three-story, 30 x 65 ft., substation. The Charles H. Tenney Co., 38 Chauncy Street, Boston, is engineer.

The Cambridge Sheet Metal Co., 295 Franklin Street, Cambridge, Mass., is taking bids on a one-story, 50 x 85 ft., automobile body shop addition. E. T. P. Graham, 171 Newbury Street, Boston, is architect.

Plans are nearing completion for a three-story and basement, 95 x 228 ft., plant for the Brier Mfg. Co., 70 Ship Street, Providence. Frank B. Perry, 44 Franklin Street, is architect.

The business of the Carter & Hakes Co., Winsted, Conn., will shortly be transferred to the American Auto Safety Co., Hartford, Conn., where safety signals will be manufactured.

The United Illuminating Co., Temple Street, New Haven, Conn., has plans for a new steam-operated electric generating station, to cost more than $2,000,000 with machinery. Bids on a general contract will be taken early in December. Westcott & Mapes, Inc., New Haven, is engineer.

The Newton Die Casting Co., New Haven, Conn., recently formed by officials of the National Lead Co., 111 Broadway, New York, and interests connected with the Marf Machine & Die Casting Co., 147 Forty-first Street, Brooklyn, has acquired a six-story factory, 50 x 200 ft., at 146 Munson Street, New Haven, lately built for the New Haven Industrial Exposition, and will establish a plant for the production of lead, zinc, aluminum and other metal die castings. Machinery from the plant of the Marf company will be removed to the new location, as well as equipment formerly used at the die casting works of the National Lead Co. A large part of initial production will be for the Motometer

Co., Long Island City, manufacturer of automobile accessories. J. H. Wettstein, an official of the National Lead Co., is chairman of the board, and W. G. Newton, president.

The Westinghouse Electric & Mfg. Co., Pittsburgh, has leased the building at 12-22 Farnsworth Street, Boston, for a new factory branch and distributing plant. Local headquarters are at 10 High Street.

The Boston & Maine Railroad Co., North Station, Boston, is said to be planning the early construction of new repair shops at Concord, N. H., primarily for freight cars, to cost more than $150,000 with equipment.

The Segal Lock & Hardware Co., 155-59 Leonard Street, New York, and its affiliated organization, the Segal Metal Products Co., same address, manufacturers of burglar-proof locks and locking devices, etc., have arranged for the closing of their plant at Stamford, Conn., operated under the last noted name, and will remove the machinery to its plants at New York and Brooklyn, where production will be concentrated.

The Meisel Press Mfg. Co., 944 Dorchester Avenue, Boston, manufacturer of printing presses, parts, etc., has plans for a new one and two-story plant, 100 x 225 ft., to cost more than $150,000 with equipment. H. S. Cleverdon, 46 Cornhill Street, is architect.

The Ted-Toy-Lers, Inc., New Bedford, Mass., manufacturer of toys and novelties, is planning the erection of a third unit, to be four stories, and to cost upward of $80,000 with equipment.

The Electric Motor Service Co., 85 High Street, Boston, has leased a floor in the building of the Grant Gear Works, Inc., at 149-51 Pearl Street, for expansion.

The F. R. Patch Mfg. Co., Rutland, Vt., manufacturer of stone and marble-working machinery, has filed plans for a two-story machine shop, 80 x 140 ft., to cost more than $30,000 with equipment. A portion of the structure will be used for a garage.

The Great Atlantic & Pacific Tea Co., 150 Bay Street, Jersey City, N. J., has acquired property at Dorchester, Boston, as a site for a new five-story storage and distributing plant, to cost in excess of $500,000 with conveying, elevating and other handling equipment. A refrigerating plant, with capacity of about 75 tons, will be installed. It is understood that Royal B. Wills, 8 Beacon Street, Boston, is architect.

The Malleable Iron Fittings Co., Branford, Conn., has acquired the Clark-Williams Engineering Co., Bridgeport, Conn., manufacturer of hardware for telegraph, telephone and power transmission lines, specializing in a patented pole foundation device made of heavy malleable iron castings. The Clark-Williams office will be removed to Branford and the company will be operated as a specialty department of the Branford company.

The Erie Steam Shovel Co., 131 State Street, Boston, has plans for a one-story, 35 x 80 ft., office and salesroom on North Beacon Street, Allston district.

South Atlantic States

BALTIMORE, Nov. 28.

CONTRACT has been let by the Southern Couch Mfg. Co., 431-37 Colvin Street, Baltimore, to the A. Goodman Co., local, for a four-story addition to cost approximately $100,000 with equipment. Stanislaus Russell, 11 East Lexington Street, is architect.

The Atlantic Coast Line Railway Co., Wilmington, N. C., is said to be arranging to rebuild the portion of its Emerson repair shops at South Rocky Mount, N. C., recently destroyed by fire, with loss close to $30,000 including equipment.

In connection with the rebuilding of its flour mill, recently destroyed by fire, the Clarke Milling Co., Berryville, Va., contemplates the complete electrification of the plant. It will cost upward of $75,000 with machinery.

The Washington and Suburban Sanitary Commission, 1420 New York Avenue, N. W., Washington, T. Howard Duckett, president, will soon take bids for the installation of four pumping plants at Gaithersburg, Md., for sewage service, to cost close to $50,000.

The Crown Cork & Seal Co., Eastern Avenue and Twelfth Street, Baltimore, manufacturer of bottle caps, bottle-sealing machines, etc., has completed plans for extensions and improvements to cost close to $20,000. L. R. White, Jr., Hearst Building, is architect. The company is reconsidering a proposition for consolidation with the New Process Co., Brooklyn, manufacturer of kindred equipment. The New York Improved Patents Corporation will be formed to take over and merge the two interests.

The American Tobacco Co., Reidsville, N. C., will soon begin the erection of a seven-story and basement addition, 82 x 250 ft., to cost more than $500,000 with machinery. J. E. Sirrine & Co., Greenville, S. C., are engineers. Headquarters are at 111 Fifth Avenue, New York.

The Air Reduction Co., Inc., 342 Madison Avenue, New York, manufacturer of industrial oxygen, etc., has concluded arrangements for the purchase of the Carolina Standard Gas Mfg. Co., Charlotte, N. C., with local plant devoted to the production of industrial oxygen, acetylene gas, compressed oxygen, etc. The purchasing company will continue operations at the factory and has tentative plans for enlargements.

The Georgia Lime Rock Co., Perry, Ga., operated by the Dixie Products Co., Columbus, Ga., has acquired about 300 acres in Houston County, vicinity of Perry, and will establish a plant for quarrying and crushing lime rock. It is planned to provide facilities for a capacity of about 35 to 40 cars per day. The new plant will cost upward of $45,000 and is expected to be ready for service in about 60 days.

The Acorn Mfg. Co., Winchester, Va., has been formed by H. H. Jennings and associates, to operate a plant for the manufacture of furniture. A factory to be built by the Factory Buildings Corporation, Winchester, H. B. McCormack, president, will be occupied under lease. The unit will cost about $40,000 and equipment about $50,000 additional. It is purposed to have the plant ready for service in February.

The American Oil Co., American Building, Baltimore, will soon ask bids on revised plans for a new two-story storage and distributing plant in the Curtis Bay section, to cost about $40,000 with equipment.

Richard S. Culbreth, 633 Calvert Building, Baltimore, trustee for the Steinmetz Electric Motor Car Corporation, defunct, will offer the plant and property of the company at a public sale on Dec. 14, including a tract of more than four acres, with one-story factory, 100 x 200 ft., machine tools and other equipment.

The General Purchasing Officer, Panama Canal, Washington, will receive bids until Dec. 13 for an electric lighting plant for canal zone service, schedule 1845.

The Southern Spring Bed Co., 350 East Hunter Street, Atlanta, Ga., manufacturer of bed springs, etc., has arranged for the sale of preferred stock totaling about $500,000, a portion of the fund to be used for general expansion.

The Washington Gas Light Co., 410 Thirteenth Street, N. W., Washington, has awarded a general contract to Davis, Wick & Rosengarten, 1406 G Street, N. W., for a four-story automobile service, repair and garage building for company cars and motor trucks, to cost approximately $250,000 with equipment.

The City Council, Winchester, Va., is said to be planning the installation of pumping machinery and auxiliary equipment in connection with extensions in the municipal waterworks. The entire project is reported to cost more than $40,000.

The Bethlehem Shipbuilding Corporation, South and Water Streets, Baltimore, a subsidiary of the Bethlehem Steel Co., Bethlehem, Pa., is said to be arranging a call for bids on a general contract in December for a main one and two-story unit, to cost more than $800,000 with equipment.

Cincinnati

CINCINNATI, Nov. 28.

WHILE a few machine tool companies report that sales in November were larger than in October, the majority have done less business, the decline being estimated at about 20 to 25 per cent. Bookings since Jan. 1 have been approximately 70 to 75 per cent of those in the corresponding 11 months of 1926 and it is expected that this ratio will show little change during the remainder of the year. Most shops are operating on a curtailed basis necessitated by the small amount of orders recently received.

Inquiries are less promising than a few weeks ago, although outstanding quotations total a good sum. Manufacturers believe that in the next 60 days sales will be light. A local builder has sold three engine lathes for delivery to Germany and also has closed several orders for shipment to South America. Buying in general is confined to minor transactions, each of which involves only one or two machines.

Contract has been let by the Broadway Garage Co., Union Central Building, Cincinnati, to the Hodges Construction Co., local, for a new seven-story service, repair and garage building, to cost in excess of $200,000 with equipment. Rendigs, Panzer & Martin, Southern Ohio Bank Building, are architects.

The Wilmington Ice Co., Wilmington, Ohio, is considering rebuilding the portion of its ice-manufacturing plant destroyed by fire Nov. 20, with loss close to $70,000 with equipment.

The Gem Metal Shield Co., Inc., Bainbridge and Bacon Streets, Dayton, Ohio, is said to be planning the construction of a new one-story factory, 100 x 200 ft., to cost upward of $50,000 with equipment.

Serina Brothers, Inc., North Bates Street, Dayton, manufacturer of composition marble flooring, etc., has acquired property at North Dayton, and is contemplating the construction of a new plant, to cost approximately $40,000 with equipment.

The Shelby County Board of Education, Memphis, Tenn., has plans for a one-story vocational shop, 65 x 105 ft., at its school at Germantown. Joseph T. Wallace, Bank of Commerce Building, is architect.

The Shelby Machine Co., 392 South Main Street, Memphis, has plans for a new one-story factory, to cost about $30,000 with equipment. E. L. Harrison, Fidelity Bank Building, is architect.

The Braun Brothers Packing Co., Troy, Ohio, will build a two-story and basement cold storage and refrigerating plant, 48 x 110 ft., in connection with an expansion program. The entire project will cost more than $65,000 with equipment. Lloyd J. Zeller, Tecumseh Building, Springfield, Ohio, is engineer.

The Davidson County Highway Commission, Court House, Nashville, Tenn., is arranging for the early erection of a one-story and basement automobile service, repair and garage building, 100 x 220 ft., to cost approximately $125,000 with equipment. Asmus & Clark, Cotton States Building, are architects.

The Progress Stove & Range Co., Sixteenth and Magazine Streets, Louisville, is planning to rebuild the portion of its foundry recently destroyed by fire, with loss close to $23,000 including equipment.

Chicago

CHICAGO, Nov. 28.

IN actual sales the local machine tool market is less active than a week ago, but dealers are working on a number of live prospects and fresh inquiry gives promise of November business closing only a trifle below the volume in October. The Chicago, Milwaukee and St. Paul has purchased a driving wheel lathe and the Burlington is asking for prices on a 36-in. heavy duty shaper. The Nash Motors Co., Kenosha, Wis., has under advisement the purchase of a number of tools for replacement, and the International Harvester Co. is still interested in miscellaneous equipment for practically all of its plants.

Dealers are creating interest among buyers by lists of machine tools carried in stock that are to be moved at reduced prices prior to inventory periods. It is reported that an advance in the price of shapers and milling machines is being considered.

The Bloom Mfg. Co., Charles City, Iowa, manufacturer of farm implements, will erect a factory, 60 x 160 ft.

The Manning Light Co., Manning, Iowa, is planning the construction of an addition to its power house, to cost $100,000 with equipment.

The North Shore Park Board, Chicago, James P. Ward, president, is planning the construction of a pumping plant of 120,000 gal. per min. capacity, to cost in excess of $500,000.

The City Council, Wood River, Ill., has authorized plans for a municipal waterworks and sewage plant, to cost in excess of $450,000. The Caldwell Engineering Co., Jacksonville, Ill., is engineer.

Richard Hickman, 4018 West Lake Street, Chicago, will build a one-story brick machine shop, 25 x 106 ft., to cost $5,000.

Ilg Electric Ventilating Co., 2850 North Crawford Avenue, Chicago, will build an addition, 80 x 81 ft. Alfred S. Alschuler, 20 East Jackson Boulevard, is architect.

The Advance Pattern & Foundry Co., 5 South Wabash Avenue, Chicago, will build a two-story foundry, 145 x 360 ft., to cost $250,000.

The Russakov Can Co., Carpenter Street and Ogden Avenue, Chicago, has awarded a general contract to H. Barth, 3128 North Kennet Avenue, for a new one-story plant, 195 x 323 ft., to cost close to $125,000 with equipment.

R. C. Fletcher, 179 West Washington Boulevard, Chicago, architect, has plans for a new six-story automobile service, repair and garage building, to cost about $375,000 with equipment.

The Continental Ice Co., Savanna, Ill., is completing plans for a new multi-story plant, to cost in excess of $300,000 including equipment. Machinery will be electrically operated.

The Pueblo Iron & Wire Works, 314-16 South Main Street, Pueblo, Colo., has awarded a general contract to Henry Weyland, local, for a one-story addition, 40 x 50 ft.

The Sherman-Klove Co., 4646 West Harrison Street, Chicago, manufacturer of screws, nuts, etc., has awarded a general contract to the Poirot Construction Co., 38 South Dearborn Street, for a new one-story plant, to be equipped largely as a machine shop, to cost about $85,000. A. Epstein, 2001 West Pershing Road, is architect and engineer.

The Grisby-Grunow-Hinds Co., Chicago, manufacturer of radio equipment, will proceed with the erection of a new two-story plant, 150 x 195 ft., at 2022 North Kolmar Avenue, to cost in excess of $200,000 with machinery. Fred V. Prather, 400 North Michigan Avenue, is architect.

The Public Service Co. of Colorado, Denver, Colo., and affiliated interests, including the Prairie Oil & Gas Co., Independence, Kan., have awarded a general contract to the Oklahoma Contracting Co., Dallas, Tex., and Williams Brothers, Inc., Tulsa, Okla., for the construction of a pipe line, with compressor stations, etc., from a point near Amarillo, Tex., to Denver, about 300 miles, to cost close to $20,000,000.

M. O. Nathan, 123 West Madison Street, Chicago, architect, has plans for a two-story automobile service, repair and garage building, to cost about $130,000 with equipment.

The Northern Pacific Railroad Co., St. Paul, Minn., has plans for new car shops at Laurel, Mont., 100 x 250 ft., to cost about $250,000 with equipment. Work will begin after the first of the year. O. M. Rognan, Railroad Building, St. Paul, is engineer.

The City Council, Austin, Minn., is arranging for the erection of a one-story steam power house, 50 x 90 ft., to cost approximately $61,000. It is understood that bids for mechanical equipment will be asked in about 60 days. Toltz, King & Day, Inc., Builders' Exchange Building, St. Paul, Minn., is engineer. The Water, Electric, Gas and Power Commission, Austin, is in charge.

The Board of Education, Great Falls, Mont., plans the installation of manual training equipment in a new high school to cost $1,000,000, for which plans will be drawn by Bird & Van Teulingen, Great Falls, architects, and Croft & Baemer, Minneapolis, Minn., consulting architects. A special election has been called Dec. 5, to approve bonds.

The Fred Jasper Battery Co., 311 High Avenue East, Oskaloosa, Iowa, manufacturer of electric batteries, etc., has awarded a general contract to P. W. Sparks, Oskaloosa, for a new one-story and basement plant, 23 x 70 ft.

The new plant of the Standard Calorimeter Co., at Fifty-second Street and Fifth Avenue, Moline, Ill., will not be occupied until next spring, because of inability to complete the machine shop before that time. The foundry building is now nearing completion.

The buggy manufacturing business of the Mutual Wheel Co., Moline, Ill., has been liquidated and equipment sold preparatory to engaging in the manufacture of automobile wheels, to which the company will devote its entire plant. A servicing for automobile wheels, rims and related parts will also be a feature in the new line.

St. Louis

ST. LOUIS, Nov. 28.

BIDS will soon be asked by the City Council, Campbell, Mo., for a municipal electric light and power plant to cost in excess of $65,000. A. C. Moore, Joplin National Bank Building, Joplin, Mo., is engineer.

The Standard Steel Works, Inc., Kansas City, Mo., has acquired adjoining property, 115 x 305 ft., and plans the erection of a one-story addition to double the present capacity. The company has taken over the Sheet Metal Products Co., Kansas City, and will expand production in this line.

The American Soda Co., 2812 Accomac Street, St. Louis, has awarded a general contract to H. F. Gassler, 2351 Michigan Avenue, for a new two-story and basement plant, 50 x 150 ft., to cost close to $65,000 with equipment. Edward Reineike, 3667 Kingshighway, is architect.

The Board of Education, Dodge City, Kan., plans the installation of manual training equipment in a new three-story high school to cost $250,000, for which bids have been asked on a general contract. Mann & Co., R. W. Building, Hutchinson, Kan., are architects.

The Independent Plumbing & Heating Supply Co., 1119 Locust Street, St. Louis, will soon take bids for a new two-story storage and distributing plant to include pipe-cutting and threading departments and general mechanical shop, to cost about $130,000 with equipment.

The Charles G. Kruckemeyer Machine & Parts Co.,

Minerva Avenue, St. Louis, has filed plans for a one-story addition, 60 x 100 ft., to cost about $50,000 with equipment.

The Kansas State Agricultural College, Board of Regents, State House, Topeka, is asking bids on a general contract until Dec. 15 for a three-story and basement power plant at Manhattan, Kan., 50 x 200 ft., to cost in excess of $300,000 with equipment. Charles D. Cuthbert, State House, Topeka, is State architect. H. E. Shrack is business manager.

The Twin State Oil Co., Earlsboro, Okla., is reported planning to rebuild the portion of its plant recently destroyed by fire, with loss in excess of $125,000 including equipment.

The Century Electric Co., 1806 Pine Street, St. Louis, has plans for a new one-story foundry, to cost about $175,000 with equipment. L. B. Pendleton, DeMenil Building, is architect.

The Metropolitan Utility District, Omaha, Neb., is at the head of a project to construct and operate a natural gas pipe line from the Amarillo, Tex., oilfields to Omaha, with compressor stations, etc., to cost more than $25,000,000. The Columbian Carbon Co., 45 East Forty-second Street, New York, operating carbon black plants in the Amarillo district, is also interested in the project.

The Board of Education, Fort Smith, Ark., plans the installation of manual training equipment in a new high school to cost $300,000, for which bids will be asked on a general contract in December. Chatten & Hammond, 160 North La Salle Street, Chicago, are architects; Bassham & Wheeler, Kennedy Building, Fort Smith, are associate architects.

Gulf States

BIRMINGHAM, Nov. 28.

THE Southern Sugar Co., 342 Madison Avenue, New York, is completing plans for the construction of a new cane sugar mill at Clewiston, Fla., where property was acquired several months ago. The initial unit will have a capacity of about 1500 tons per day, and the ultimate plant will have a rating of more than 5000 tons daily. The project will include a power house, machine shop and other mechanical buildings. The company is affiliated with the Celotex Co., 645 North Michigan Avenue, Chicago, manufacturer of wallboard products from sugar cane waste. The latter organization proposes to construct a mill later in conjunction with the sugar refinery, utilizing the waste material from the plant. It is said that the latter works will have a capacity of more than 500,000 ft. per month. The sugar mill is reported to cost more than $1,200,000. B. G. Dahlberg is head of both companies.

The E-Z Opener Bag Co., Decatur, Ill., is completing plans for the construction of its new mill at Tuscaloosa, Ala., for the manufacture of paper and paper bags, where property was recently acquired. The entire project is reported to cost approximately $2,000,000 with machinery.

The Texas & Louisiana Light & Power Co., Goldthwaite, Tex., is planning extensions and improvements in its electric light and power plant, and ice-manufacturing plant, recently acquired from the city, with installation of additional equipment. The expansion is reported to cost more than $25,000. Edward Geeslin is manager.

The Common Council, Floranada, Fla., is considering the installation of pumping machinery and auxiliary power equipment in connection with a proposed municipal waterworks, for which a fund of $125,000 is being arranged.

The Florida Public Service Co., De Land, Fla., has arranged for a bond issue of $1,814,000, a portion of the proceeds to be used for extensions and improvements, including transmission line construction. The company is operated by the General Gas & Electric Corporation, 50 Pine Street, New York.

The Common Council, Morgan City, La., is considering the installation of a municipal electric light and power plant, to cost close to $100,000 including machinery.

The Central Power & Light Co., Frost National Bank Building, San Antonio, Tex., has plans for enlargements in its ice-manufacturing plant at Beeville, Tex. The entire plant will be electrified.

The Southwestern Cast Iron Pipe Co., 516 Daizell Street, Shreveport, La., is said to have plans for new local works, including machine shop and foundry, to cost more than $25,000 with equipment.

The Phillips Petroleum Co., Bartlesville, Okla., plans the early construction of a new gasoline refinery in the Bowers pool, near Amarillo, Tex., to cost close to $100,000 with equipment.

The Mississippi Power & Light Co., Jackson, Miss., is disposing of a bond issue of $9,000,000, a portion of the proceeds to be used for extensions and improvements. The company is under the direction of the Electric Bond & Share Co., 71 Broadway, New York.

The Southern Wheel & Rim Co., 700 Avenue F, Birmingham, manufacturer of automobile rims, wheels, etc., has awarded a general contract to the Mackie Shepherd Co., 615 South Twenty-seventh Street, for a one-story addition, 50 x 140 ft., a portion of the structure to be used for storage and distributing service.

The Caddo Parish School Board, 617 Edwards Street, Shreveport, La., E. W. Jones, superintendent, contemplates the installation of manual training equipment in a new two-story and basement high school on the State fair grounds, to cost about $350,000, for which superstructure will soon begin. Edward F. Nield, City Bank Building, is architect.

The Walt-Built Homes Co., 1930 Fredericksburg Road, San Antonio, Tex., is planning the installation of electrically-operated wood-working machinery in a local plant.

The Acme Machine Co., Pier A, Galveston, Tex., has been organized to manufacture machinery and parts, mainly for marine work. The company owns patents on a double seated valve and will be in the market for portable electric welders, 36-in. lathes, milling machines and piston ring stock.

Cleveland

CLEVELAND, Nov. 28.

WHILE the machine tool market is not very active, the volume of business and inquiry is somewhat better than a few weeks ago. Some new inquiry is coming from metal-working plants figuring on new work which, if placed, will require additional machinery.

A local manufacturer who has been buying tools for making automobile parts, bought five lathes the past week which finishes its purchases. Turret lathes are in fair demand but orders are for single machines. Manufacturers in some lines have advised the trade that they will buy no more machinery this year and some railroads have adopted the same policy so that the outlook for December business does not appear very bright.

The Air-Way Electric Appliance Corporation, Auburn Avenue, Toledo, Ohio, manufacturer of electrical equipment, will build a one-story top addition to its plant, 60 x 140 ft., to cost close to $90,000 with equipment. Mills, Rhines, Bellman & Nordhoff, Ohio Building, are architects and engineers. Pratt E. Tracy is president.

The Board of Education, East Sixth Street and Rockwell Avenue, Cleveland, is said to be planning the erection of a one-story shop unit at the Eagle trade school, primarily for instruction in foundry work, to cost more than $35,000. F. G. Hogen is director.

The National Acme Co., East 131st Street and Coit Road, Cleveland, manufacturer of screw machinery, etc., is arranging for a bond issue of $2,500,000, a portion of the fund to be used for expansion, including the recent acquisition of the Positive Filling Machine Co., Philadelphia, and increase in the latter line of output at the Cleveland works, comprising centrifugal clarifiers, separators, etc.

The G. E. Olenberg Motor Sales Co., 3201 West Twenty-fifth Street, Cleveland, has awarded a general contract to L. F. Skeel, 4481 South Hill Drive, for a two-story service, repair and garage building, 155 x 279 ft., to cost about $100,000 with equipment.

The Board of Trustees, Y. M. C. A., East Twenty-second Street and Prospect Avenue, Cleveland, is completing plans for a four-story technical and vocational school, 50 x 120 ft., to cost about $200,000 with equipment. Hubbell & Benes, 4500 Euclid Avenue, are architects. R. Lewis is secretary.

Detroit

DETROIT, Nov. 28.

THE Gorham Tool Co., 2206 Twelfth Street, Detroit, has plans for a one-story addition, 60 x 130 ft., to be used primarily as a machine shop, to cost close to $40,000 with equipment. Lane, Davenport & Peterson, Charlevoix Building, are architects.

The L. H. Gilmer Co., Wayne, Mich., manufacturer of belting, webbing for automobile bodies and radiators, etc., is considering rebuilding the portion of its plant destroyed by fire Nov. 18, with loss reported at close to $100,000 with equipment. Headquarters are at Tacony, Philadelphia.

The Chrysler Motor Car Corporation, 341 Massachusetts Avenue, Highland Park, Detroit, is having plans drawn for two additions, to be one and two stories and one story, respectively. The first noted, 60 x 400 ft., will be equipped largely for enameling, and is estimated to cost upward of $150,000 with equipment; the other structure will be used

for the body department. Smith, Hinchman & Grylls, Marquette Building, are architects.

The Allison Appliance Co., Francis Palms Building, Detroit, manufacturer of electric refrigerating equipment, is said to be planning to purchase a quantity of parts and materials for production, including steel and brass stampings, pumps, etc.

The Grand Trunk Railway Co., 400 East Jefferson Street, Detroit, is planning the construction of a new engine house with repair facilities, with capacity of about 50 locomotives, and car repair plant, with new classification yards and other departments in Royal Oak Township, near Ferndale, Mich., to cost upward of $150,000 with equipment.

The Detroit Lubricator Co., 5842 Trumbull Avenue, Detroit, has plans for a two-story addition, 65 x 100 ft., for carbureter and kindred manufacture, to cost more than $60,000 with equipment. Robert O'Derrick, Inc., 120 Madison Avenue, is architect and engineer. Charles H. Hodges is president.

The General Tire & Rubber Co., Akron, Ohio, will soon take bids on a general contract for a new one and two-story factory branch and distributing plant at Grand Rapids, Mich., to cost in excess of $75,000 with equipment. H. H. Wemhoff, Murray Building, Grand Rapids, is architect.

The National Porcelain Enameling & Foundry Co., Detroit, care of Frank G. Cordner, 415 Brainard Street, architect, recently organized, has acquired about two acres on the Plymouth Road and will soon begin the erection of the first unit of a new plant, to cost close to $100,000 with equipment.

The Paige-Detroit Motor Car Co., West Warren Street, Detroit, has disposed of a new stock issue totaling $3,000,000, a portion of the proceeds to be used for expansion and operations.

The Lakin-Allen Electric Co., Detroit, has removed its office and shop to a new building at 219 Waterman Avenue.

Milwaukee

MILWAUKEE, Nov. 28.

SENTIMENT in the machine-tool trade is showing a change for the better as the result of greater inquiry and a slight but gratifying betterment in demand. Payrolls of foundries and machine shops are again tending upward after a period of decline, and while few industries are acquiring new equipment save for urgent replacements, the character of inquiry portends more activity. Most orders are for single items or two or three machines of a miscellaneous character, but are more numerous.

The Gillette Rubber Co., 799 Wisconsin Street, Eau Claire, Wis., which is completing several plant additions, is starting work on a two-story extension, 52 x 80 ft., to the mixing room unit. The total cost of all current improvements is estimated at $150,000.

The White Rock Crystal Silica Co., Rockford, Ill., contemplates the construction of a plant for the development of a large area of silica deposits near Monroe, Wis. The initial investment will be about $40,000. Dr. Robert Wehenn, Rockford, is president.

The North Side Chevrolet Co., 1539 Green Bay Avenue, Milwaukee, has placed the general contract with E. C. Knuth & Co., 2907 Fond du Lac Avenue, local, for a $50,000 sales and maintenance building, two stories, 50 x 150 ft. The architect is Julius Leiser, 105 Wells Street.

W. H. Norton of Chicago, designer and patentee of a new machine for automatically rolling wrapping paper in mills, has decided to locate his new industry in La Crosse, Wis., and expects to be in production by Jan. 1. A new corporation is being organized by Mr. Norton and L. W. Morgan and A. A. Hutchison, Bangor, Wis., who have leased the plant of the Bump Paper Fastener Co., 1830 West Avenue, South, La Crosse.

Harry Newburg, La Crosse, Wis., has broken ground for a two-story automotive sales and service building, 60 x 145 ft., to cost about $50,000. The designer and general contractor is the Preschl & Hanson Co., Newburg Building, local.

The Vernon County Board, Viroqua, Wis., has accepted the bid of Carl Ahlman & Co., local, for the construction of a boiler house, machine shop and pump house, 40 x 100 and 20 x 30 ft., at the Vernon County Asylum. The cost complete will be about $25,000. The architects are Merman & Skogstad, La Crosse, Wis.

The Century Fence Co., Waukesha, Wis., has sold its tube manufacturing facilities to the Mid-West Forging Co., 38 South Dearborn Street, Chicago, with works at Chicago Heights, Ill. The Century company will devote its entire plant and equipment to the development and manufacture of institutional and industrial fencing.

Indiana

INDIANAPOLIS, Nov. 28.

THE Herff-Jones Co., Jackson Building, Indianapolis, manufacturing jeweler, specializing in the production of medals, pins, plated novelties, etc., has acquired a one and two-story building at 1411 North Capitol Avenue, totaling about 17,000 sq. ft. of floor space, for a new plant for larger output.

Charles T. Bragg, head of the Bragg Engineering Co., General Motors Building, Detroit, and associates have organized the Alloys Refining Corporation under Indiana laws, with capital of $100,000, to establish a plant at Indianapolis for the manufacture of metal alloys. A primary feature of production will be brass ingots, and the initial plant is expected to cost in excess of $80,000 with machinery. It is proposed to have the unit ready for service early in March. Others interested in the new company include Norman A. Perry, Edwin S. Pearce and L. Frank Treat, all of Indianapolis.

The Board of Education, Hobart, Ind., is considering the installation of manual training equipment in a new one and two-story high school in the Country Club Estate section, to cost about $200,000. Wainwright, Vaughn & Co., First Trust Building, Hammond, Ind., is architect.

The Western Oil & Refining Co., 310 North Meridian Street, Indianapolis, has plans for a one-story mechanical unit at its property at Cambridge City, Ind., including machine shop, to cost more than $35,000 with equipment. Bishop, Knowlton & Carson, 312 North Meridian Street, are architects.

The Water Works Department, Evansville, Ind., will soon take bids for extensions and improvements in the municipal waterworks to cost more than $500,000. The project will include an addition to the present pumping plant and new pumping and power equipment; extensions in machine shop and new machinery; electrification of present pumping apparatus and modernization of other equipment; standpipe and other mechanical apparatus. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers. The department also has plans for a new equipment storage and distributing plant, 70 x 150 ft., with service, repair and garage facilities for cars and motor trucks. Frank J. Schlotter, 113 Upper Fourth Street, is architect.

The Board of Education, Evansville, Ind., is considering the installation of manual training equipment in a new two-story high school to cost about $300,000, for which plans are being drawn by Fowler & Karges, Furniture Building, architects.

Pacific Coast

SAN FRANCISCO, Nov. 23.

CONTRACT has been let by the Western Alloy & Tool Steel Co., 562 Bryant Street, San Francisco, to Barrett & Hilp, local, for a new one-story plant to cost about $22,000. Edward Eames, 353 Sacramento Street, is architect.

F. W. De Foy, 3876 South Vermont Avenue, Los Angeles, has plans for a one-story machine shop, to cost about $14,000 with equipment.

The Roosevelt Irrigation District, Phoenix, Ariz., is disposing of a bond issue of $2,500,000, the majority of the fund to be used for the installation of an irrigation system in Mariposa County, comprising pumping plants, pipe lines, etc., with electric power transmission lines. Howard S. Reed, Phoenix, is consulting engineer.

The Brunswick-Balke-Collender Co., 629 South Wabash Avenue, Chicago, manufacturer of talking machines, billiard tables, etc., has purchased property in the Union Pacific Industrial tract, 175 x 400 ft., for a new branch plant. The initial unit will be one story and will cost close to $250,000 with equipment. The Moran Co., 740 South Broadway, Los Angeles, is architect. Los Angeles offices of the company are at 84 South Los Angeles Street.

The Northwestern Pulp & Paper Co., Porter Building, Portland, will soon begin the erection of a new paper and pulp mill at Astoria, Ore., to cost in excess of $1,500,000 with machinery. T. B. McBain, Oregonian Building, Portland, is consulting engineer.

The Kern County Ice Co., Bakersfield, Cal., recently formed by G. W. Gurtner and O. P. Nichols, Los Angeles, is planning the erection of a new ice-manufacturing and cold storage plant on local site, to cost upward of $75,000 with machinery.

The Puyallup & Sumner Fruit Growers' Association, Puyallup, Wash., plans the installation of a cold storage and precooling plant in its new canning factory. The entire project will cost close to $80,000 with equipment.

The General Tire & Rubber Co., Akron, Ohio, is reported to be planning the purchase of a site at San Diego, Cal., for a new mill for Pacific Coast trade, to cost in excess

of $3,000,000 with machinery. It will include power house, machine shop and other mechanical departments.

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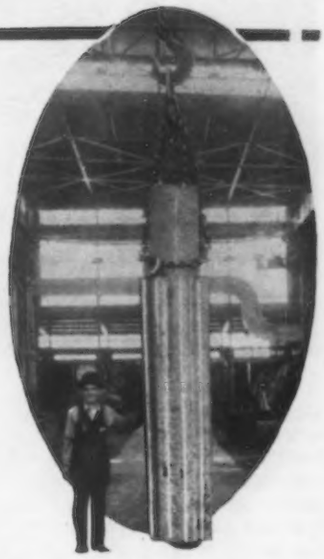

Making Large Bronze Ingots

Difficulties Overcome in Pouring and Machining Aluminum Bronze—Refinements Necessary in Heat Treating and Forging

BY JEROME STRAUSS*

ENGINEERING demands, in the case of large forgings of the simpler structural carbon and alloy steels, have caused a progressive growth of the size of ingots of these steels to a point such that further increase is nearly, if not completely, prevented. A limiting diameter has practically been established by cost factors (as influenced by discard loss, etc.) and by the properties of the steels themselves in respect to ability to secure soundness and reasonable homogeneity in larger cast masses.

Current practice in the more highly alloyed steels, such as the chromium and chromium-nickel corrosion resistant steels, have closely approached, for solid (not hollow) forgings, a similar limitation at considerably lower cross-sectional ingot dimensions. This difficulty of securing uniformity and central structural integrity will no doubt be overcome to a degree and limiting ingot sizes increased as our knowledge of these "younger" alloy steels is improved.

In the case of many of the non-ferrous alloys, however, maximum present ingot sizes have been established, not by limitations imposed by the properties of the metals, but by the absence of demand for large forgings. Ingots of duralumin, for example, have generally weighed not much over 400 lb., although a few have recently been produced at the Naval Gun Factory weighing slightly under 1000 lb., and there appears no reason for anticipating difficulties in casting sound, uniform ingots of this metal in somewhat larger sizes should the need develop.

*Material engineer, United States Naval Gun Factory, Washington.

Currently manufactured commercial ingots of aluminum bronze generally weigh not in excess of 200 to 500 lb., according to the dimensions of the bars or sheets required, and in these commercial fields increase in ingot dimensions is likely to occur chiefly as the result of the production requirements of the chemical industries. For forgings of 4 to 6 in. diameter, the Naval Gun Factory has been pouring 10 to 12 in. diameter ingots weighing 1200 to 1500 lb. That no difficulties are involved in producing ingots of this metal weighing 15,000 lb. is illustrated by the facts recorded in this article.

How They Are Melted and Poured

TO date six such ingots of the nominal composition—copper 88 per cent, aluminum 9 per cent, iron 3 per cent—have been produced and the uniformly good quality of the forgings made from these ingots affords proof of the merit of the methods employed. These methods, particularly those used in casting, may appear totally at variance with the hitherto observed properties of this alloy, largely no doubt because those who have had experience with it have been confined to its preparation in small sections and small masses.

The molten metal for each ingot was prepared in 32 clay-graphite crucibles in coal-fired pit-type furnaces. The copper was first charged and melted, covered with a layer of charcoal and then deoxidized by successive small additions of 50:50 copper-manganese until a small test button, cast in core sand, showed satisfactory shrinkage on solidification. Half of the aluminum was

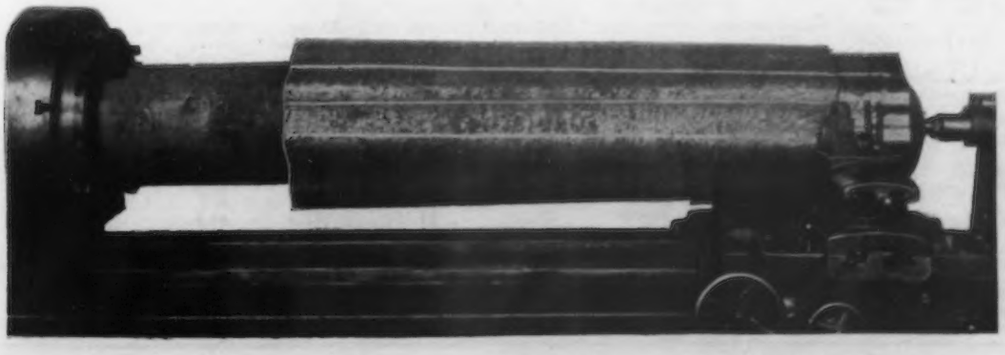

Fig. 1—15,000-Lb. Aluminum Bronze Ingot in Lathe

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